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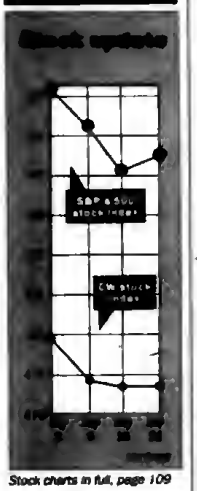

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TOP OF THE NEWS

In antitrust charges filed against DEC, a third-party vendor claims it is being locked out of selling compatible equipment. **Page 12.**

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MIS departments to be a tough sell for Lotus's micro-mainframe products. **Page 2.**

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Ford announces negotiations with IBM for a corporatewide systems contract. **Page 4.**

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Burroughs rolls out a low-end mainframe offering twice the power of its 2-year-old A 3. **Page 35.**

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The computer industry slump will continue into the second half of 1987, economists predict. **Page 6.**

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Software Publishing aims for corporate sales with a more powerful software lineup and site licensing options. **Page 13.**

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Software to convert handwriting into ASCII characters expected to debut late this year. **Page 23.**

■

Norton Co. sends executives and factory floor workers to CAMP. **Page 65.**

■

DEC's scheduled announcement Aug. 5 is expected to either fill out superminicomputer lineup with a VAX 8700 general-purpose system, comparable to the high-end VAX 8800 scientific machine, or boost the performance of the current high-end general-business systems, the VAX 8600 and 8650, with the addition of the Bi bus. The anticipated Vaxmate, an IBM PC AT challenger, reportedly will be coming at a later date.

■

Industry sources say Symbolic tomorrow will introduce two systems, the 3620 and 3650, in a move to tighten its product line. Both systems are expected to incorporate Symbolics' proprietary gate-array, very large-scale integrated technology, which was introduced in April

See **NEWS** page 10

Chip triggers software race

VM functions, AI packages promised for Intel 80386

By David Bright

SANTA CLARA, Calif. — Software vendors are rushing to exploit the powerful 80386 32-bit architecture now that chip manufacturer Intel Corp. has begun shipment of the long-awaited microprocessor.

Last week, Softguard Systems, Inc., based in Santa Clara, announced that it is developing a microcomputer operating system for the 80386 that is patterned after IBM's mainframe VM operating system.

Next week, Intel is expected to announce agreements with six artificial intelligence software vendors to port their Lisp and Prolog languages to the 80386.

See **CHIP** page 12

OSI substitute lures net users

By Elisabeth Horwitt

Business users eager to implement multivendor networks are increasingly turning to an alternative that already offers much of the networking versatility only promised by Open Systems Interconnect protocols from the International Standards Organization.

According to user and industry sources, the alternative, called Transmission Control Protocol/Interconnect Protocol or TCP/IP, provides an array of low-level networking functions for more than 50 vendors' systems. Among these functions are transport, routing, end-to-end reliabli-

See **OSI** page 8

Big 8 firm, politics tied to 4GL snafu

By Charles Babcock

TRENTON, N.J. — A state agency's monumental systems logjam, which attracted nationwide attention last year, stemmed from the misuse of a fourth-generation language, according to the New Jersey State Commission of Investigation. A recent commission report charged that the fourth-generation language misuse was compounded by election-year political considerations.

The commission reserved its harshest criticism for Price Waterhouse & Co., the Big Eight accounting firm whose expertise was enlisted to totally redo the Department of Motor Vehicles' systems. One goal of the project, in addition to developing more efficient systems, was to build more flexibility into the department's information retrieval system, so high-risk drivers could be isolated for insurance purposes.

Price Waterhouse, which served as the state's $6.5 million consultant on the project, used a fourth-generation language to speed up development of the DMV systems.

The firm was directed by state officials to complete the planned five-year project in less than two years so that incumbent Gov. Thomas Kean could take credit for the improvements when he ran for re-election, the report said.

Price Waterhouse was selected after state computer experts were frozen out of responsibility for the new system, according to the report. Price Waterhouse obtained the contract on a hurry-up basis without competitive bidding, a practice the commission criticized harshly.

Price Waterhouse Director of Marketing Bernard R. Cammarata in New York denied the report's conclusion and said the firm was dismayed by the findings. "We

See **BIG** page 4

CW SPECIAL REPORT

Downsizing: Cox shifts DP from mainframes to remote minis

By James A. Martin

ATLANTA — The cable television division of communications conglomerate Cox Enterprises, Inc. is completing a radical reorganization of its information systems resources. In a dramatic instance of MIS downsizing, the division is dumping its IBM mainframe in favor of an IBM System/38, slashing its central MIS staff by 90% and distributing information processing responsibilities to 25 cable TV operations around the country.

Diverging from the trend toward bigger and bigger processors, Atlanta-based Cox is instead distributing information systems responsibility among the business managers at its cable companies. The remote units increasingly rely on the technical expertise of turnkey systems vendors for programming and support services.

As a result, the DP staff at headquarters has been dramatically reduced, from 155 last year to about 60 today and a projected 15 to 16 for next year. Only about four or five headquarters DP staff members went to new jobs at remote sites.

Cox's Prater

"I realize this project is totally unorthodox from the DP perspective, where unplugging a mainframe is a sin," says L. Roy Prater, vice-president of MIS for Cox Cable Communications, a subsidiary of Cox Enterprises. "But it is totally suitable and absolutely practical from a business perspective."

Specifically, the division's IBM 3081 Model K mainframe, which at one time supported more than 1,200 remote IBM 3180 and 3278 terminals and some 500,000 remote interactive TV converters, is being replaced by an IBM System/38 as the main processor. Cox Cable's 25 cable firms, scattered from Cranston, R.I., to Spokane, Wash., are trading in remote terminals for either IBM System/36 Models B23 through B26, System/38s or Tandem Corp. Nonstop and TXP models.

See **DOWNSIZING** page 71

Lotus faces tough MIS market for micro-mainframe package

Data exchange tool to ship next month

By Douglas Barney

CAMBRIDGE, Mass. — Lotus Development Corp. is entering a hotly competitive market by selling micro-to-mainframe data extraction software directly to a hard-to-please DP/MIS community.

The firm, noted for its dominance of the microcomputer spreadsheet market, is pitting itself against a sometimes skeptical DP/MIS community, current products from more than 200 vendors and future products expected from IBM or written to IBM specifications.

The Application Connection (TAC), Lotus's solution to micro and mainframe data exchange, is set to ship next month and will compete with a variety of micro-to-mainframe communications packages such as Answer/DB from Informatics General Corp., Interactive PC Link from McCormack & Dodge Corp., Infogate from Cullinet Software, Inc. and a slew of IBM 3270 terminal emulation packages. The TAC line is an enhanced version of the Ilink products acquired by Lotus earlier this year from Infocenter Software, Inc.

TAC is a combination of micro and mainframe software that allows users to extract data from a variety of host applications and translates the data into PC file formats. The data can then be retranslated and sent back to the host. "There are a whole lot of people who are having problems getting data from applications such as Focus and Nomad into their spreadsheets," explains Mussie Shore, product manager for TAC.

Users divided

Potential users, however, are divided on whether Lotus will be successful in this market. "I am skeptical. It woo't deal with [Cullinet Software's] IDMS, so we would at least need that product. Our files and the information on them are complex enough that users of the data wouldn't be able to comb through and get the data they need. We would need someone between the user and the files," says Ronald Jenks, partner and director of information services for Touche Ross & Co. "We have pretty massive files. I haven't been able to find a product that will cut across all those."

One potential user, however, is impressed with TAC. "I am impressed by the way the product looks. It has a lot of potential," says Merv Adrian, chairman of the micro-to-mainframe special interest group of the New York PC Users Group. "What I saw was impressive, and their business strategy is good," according to Adrian.

Fortunately for Lotus, the market for products that exchange data between micros and mainframes is large and growing, which may enable the company to buck critics. According to Framingham, Mass.-based International Data Corp., the market for micro-to-mainframe links will reach $1.3 billion next year, up from $450 million this year.

"It is a very good market, but the key is the mainframe piece and how you get at the mainframe data base. It has been a very confused market because there are so many of these products," notes Frank Dodge, president of McCormack & Dodge, which markets Interactive PC Link, a product that also extracts data from host applications and translates the data in PC formats. According to Dodge, there are at least 150 programs that transfer files between PCs and mainframes, but these products don't solve the problem of easy access and translation of data.

"It is definitely a growing market. Most PCs in corporate environments are either stand alone or doing just simple terminal emulation," says David Ferris, chairman of Ferrin Corp., a PC consultancy based in San Francisco. The current need is to make PCs an intelligent part of larger systems, he adds.

Biggest challenge

ANALYSIS

Perhaps the biggest challenge will come next year when IBM makes its Server-Requester Programming Interface (SRPI) fully available to applications developers. This interface provides a standard format for the development of micro-to-mainframe communications packages and could result in a host of hooks into mainframe applications that will compete with TAC.

SRPI "is a combination of software and hardware adapter cards that allow the end user on a PC to go into the host's data base without needing to use the host's data base format. It is an expensive link but a very comprehensive link," says Clare Fleig, director of systems research for International Technology Group of Los Gatos, Calif.

"There is going to have to be some rewriting of data and recapitulation of some of the mainframe packages. It is going to be a long-term transition, but it is the direction that IBM is definitely going in," Fleig says. "IBM says you are going to basically be able to tap into all of the major mainframe applications at some point."

Not a threat

The IBM strategy does not pose a threat to Lotus's offering, argues Lotus's Shore. "They are proposing to attack the problem of how to get data from IBM's DB2 to PCs but nothing about other data base management systems on the host," Shore claims. "They are moving in the right direction, but it is oot competitive at this point because they are protectiog DB2."

Others also voice skepticism about SRPI. "SRPI falls short of the kinds of things Ilink was doing," Ferris says. The primary focus of SRPI is to query live DB2 data bases. For other host applications, programmers must extract data bases for users to access. "It is not clear that IBM will succeed with the software," Ferris observes.

Although some elements of SRPI will be available this quarter, other key aspects will not ship until late next year, Ferris says.

In this issue

ILLUSTRATIONS ON PAGES ONE AND 17 BY ALAN WITSCHONKE

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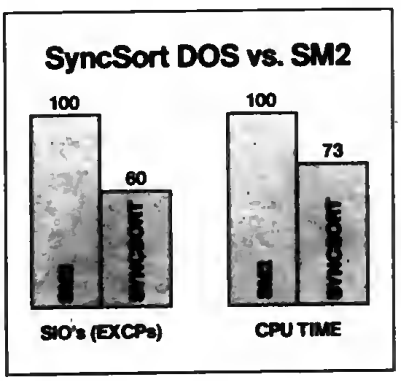

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Ford looks to IBM for OA systems cohesion

Compatibility cited in single-vendor approach

By Alan Alper

NEW YORK — Ford Motor Co. late last week confirmed that it has chosen IBM, over Digital Equipment Corp. and Wang Laboratories, Inc., to devise a comprehensive office automation strategy for its North American operations.

In a prepared statement, Ford said that after several months of consideration, the No. 2 auto maker concluded that it "would benefit substantially" from having only one vendor supply its office automation needs. Sources close to the bidding have said that over time, Ford has purchased mainframe computers from IBM and Burroughs Corp. and departmental minicomputers from Wang. The firm is also believed to have purchased engineering systems from DEC.

By selecting a single vendor, Ford said, it would be able to take full advantage of "leading-edge technology without the problem of coping with incompatible equipment."

Ford spokesman Jim Trainor pointed out that while the automotive concern has appointed IBM as its designated supplier, a contract has not yet been awarded. "We're continuing to negotiate with them," Trainor said.

Trainor did say that Ford intends to purchase between $300 million and $400 million worth of office automation equipment and services during the next five years, including approximately 30,000 workstations.

Sources said that, given IBM's mediocre financial results for the first half of the year [CW, July 21] and lost momentum in the minicomputer area, the firm pulled out all stops to secure Ford's business.

"Ford was very important to IBM," one source close to the bidding said. "They wanted to win this contract to serve notice that they don't intend to lose anymore business to DEC."

In a related matter, *Computerworld* learned that Ford is also seeking bids from software developers to devise a corporatewide programming methodology to be used by Ford's 20 systems organizations.

Big 8 firm tied to 4GL snafu

From page 1

feel the commission ignored a great deal of what we submitted."

For its part, Price Waterhouse blamed much of the DMV snafu on the fourth-generation language it selected, Ideal, from Applied Data Research, Inc. (ADR). According to the report, Price Waterhouse found Ideal to be "replete with software bugs."

Since its initial October 1983 release, two additional versions of Ideal have been issued that are geared to improving performance and eliminating glitches, ADR officials said.

At the start of the DMV project, Ideal was used exclusively in applications, despite a series of warnings cautioning that its use was inappropriate. According to the report, state computer experts' tests indicated Ideal would run too slowly for DMV applications. Tests conducted by Price Waterhouse itself showed Ideal ran more slowly than Cobol. And ADR executives warned Price Waterhouse that Ideal was being used inappropriately.

At a Sept. 25, 1984, meeting, Joseph W. Farrelly, ADR's vice-president for research and development, told Price Waterhouse representatives that Ideal should not be used exclusively, according to the investigators. ADR subsequently arranged training in Cobol programming for Price Waterhouse personnel so the DMV systems could be built with Cobol components, the report stated.

Farrelly told *Computerworld* he found little to disagree with in the portrayal of ADR in the report.

Price Waterhouse managers did not begin incorporating Cobol components into new systems until late in the project's history. As each new system was brought on-line, the runtimes of the earlier Ideal systems increased, and by the July 1, 1985, completion date, the DMV found it did not have enough time during the night to update data bases with the number of transactions conducted during the day, the report said.

As a backlog of 1.4 million automobile registrations built up, police had to be ordered to stop arresting people for driving unregistered cars. Car owners found that their automatic registration renewal forms listed the wrong vehicle, and police departments found their cruisers were registered to another town, according to *Computerworld* reports at the time.

In addition, while the system was supposedly being built for 1,000 terminals, it had been bogged down with 220 terminals. The Price Waterhouse contract specified only a satisfactory response time for terminals, which, according to DMV officials, meant three to five seconds. Actual response times were in the five- to eight-second range at best and frequently were one to two minutes, the report said.

Each DMV clerk actually found it necessary to use two terminals. With logon procedures requiring from 10 minutes to one hour, they found it difficult to sign off one system and sign on to another, the report said.

In its initial release in October 1983, Ideal was estimated to be 25% to 30% slower than Cobol in an online test program and 15% to 20% slower in batch processing, according to a test run by Price Waterhouse.

But the new DMV systems were bogged down in difficulties that slowed the system to times beyond these percentages, the report said. Ideal provided a method of retrieving data under compound conditions, "a very nice feature," said Price Waterhouse principal Norman Statland."

But compound Boolean selection, as it was called, ate up machine resources and proved "a very delaying feature," the report quoted Statland as saying. Price Waterhouse did not discover how to circumvent the problem with Cobol programs until a month before its July 1 deadline.

In addition to technical problems, Price Waterhouse experienced a high rate of turnover among the "recent hires" that the commission said the firm used on the project. The position of data base administrator, a key post in the project, turned over seven times "due to circumstances beyond our control," Price Waterhouse officials told the commission.

Price Waterhouse committed itself to correcting the DMV system problems, primarily by rewriting transaction processing parts in Cobol. That process is largely completed, Cammarata said. The rewrite process has caused Price Waterhouse expenses to run "far past the amount of the contract," he said.

New Jersey officials have not indicated whether they will invoke penalty clauses for late completion of the project.

The state attorney general's office has indicated it is considering seeking redress for added state expenses in a civil suit. In addition to spending $1 million for extra personnel and consulting personnel time, the state had to purchase an additional $3 million CPU beyond estimated CPU upgrades to supply enough processing power.

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ADAPSO warms to Big Eight rivals, welcomes two to group

Disputes remain, but cooperation stressed

By Clinton Wilder

Although the critical issues of their dispute have not been resolved, the computer software and services industry and the accounting industry are changing their relationship from confrontational to cooperative.

Service industry organization ADAPSO, long critical of the role of Big Eight accounting firms in computer services, has welcomed Price Waterhouse & Co. as a member and will soon add Arthur Andersen & Co. to its membership roster. While some traditional ADAPSO members still say there is a conflict of interest in auditing firms offering MIS services, ADAPSO has officially acknowledged the firms' legitimacy in the computer services market.

"Some wounds have healed on both sides," says ADAPSO Chairman George Raymond, president of Automatic Business Centers, Inc. in Morristown, N.J. "Our feeling is that, if in fact they are in professional services, they are entitled to be members of ADAPSO."

ADAPSO had long argued that auditing firms contracted by clients to advise on software or services decisions would recommend services offered by the auditing firms themselves [CW, Oct. 22, 1984]. ADAPSO's legal counsel attempted to bring a case to prove that accusation, but ADAPSO has tempered its position after the legal effort met with little success, according to Raymond.

'Fair competition'

"We never found a case that our legal adviser felt was substantive enough," he says. "There doesn't seem to be that kind of scenario taking place any longer. Where the accounting firms do recommend their own software, they are honest and aboveboard about it. No one likes competition, but at least it's fair competition."

"There are still some legitimate concerns and differences of opinion," adds ADAPSO spokesman David Sturtevant. "But we believe those concerns will be better handled with Big Eight firms on the inside. We have also done better with AT&T and the divested Bell operating companies as members, even though we don't always agree on things."

Sturtevant confirms that Arthur Andersen is expected to finalize its ADAPSO membership in the near future. A long-standing target of ADAPSO accusations in the past [CW, June 25, 1984], Chicago-based Arthur Andersen has been the most aggressive Big Eight firm in developing and marketing MIS-related consultant and systems installation services.

ADAPSO Membership Director Miriam Wallman says that preliminary discussions about joining have been held with other Big Eight firms, but none are expected to join in the near future.

Pittsburgh-based Price Waterhouse joined ADAPSO in April 1985. Price Waterhouse's liaison to ADAPSO could not be reached for comment.

Illegal copying case dismissed

RIVERHEAD, N.Y. — A case against a Long Island, N.Y., man accused of copying a hospital's version of IBM's Patient Care System and selling parts of it to another hospital has been dismissed by a Suffolk County Supreme Court judge.

Frank Russo, 41, former director of systems analysis at University Hospital in Stony Brook, N.Y., was indicted early last year by a Suffolk County grand jury for allegedly making illegal use of secret scientific material.

Also charged in the case was Russo's consulting firm, Stony Brook Systems, located in nearby Hauppauge, N.Y., currently a division of Travenol Laboratories, Inc.

The indictment alleged that Russo, while with the hospital, had copied features of the $300,000 patient care system and later sold them to Albert Einstein Medical Center in Philadelphia [CW, Feb. 25, 1985].

Russo was indicted under a section of the state criminal code, "Theft, Other Offenses," which has been put on the books to provide legal recourse in cases involving the reproduction of proprietary material.

If convicted of the felony offense, Russo could have received up to four years in prison, and his consulting firm could have been fined $10,000.

Spokesmen for the Suffolk County Supreme Court and the New York State Deputy Attorney General's office said the case was dismissed on July 15. Both declined to say on what grounds it was dismissed.

The spokesman for the Deputy Attorney General said Judge John Copertino dismissed the case without comment after Russo's attorney made a motion for dismissal.

Russo could not be reached for comment.

— Alan Alper

Economists predict industry slump will persist into 1987

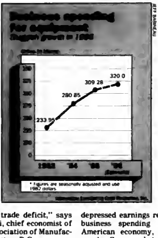
By Mitch Betts

The economic boom that is supposed to help the computer industry out of its slump has been postponed until 1987.

Business economists are backing off their earlier predictions that the second half of 1986 would see moderate improvements in business profits and spending [CW, May 26], as the Department of Commerce reported last week that the U.S. economy grew at a sluggish annual rate of only 1.1% in the second quarter of 1986.

Lower inflation, lower oil prices and lower interest rates were all reportedly supposed to boost the economy in the second half of this year, but perplexed economists now say the beneficial effects will be delayed until 1987. A persistent trade deficit and a devastated energy industry are cited as reasons the predicted economic boom has not occurred.

The latest Commerce Department figures "point toward a second half that shows stronger growth than the second quarter, but we won't get a strong rebound because of the continued drag of weak capital spending and a huge trade deficit," says Jerry Jasinowski, chief economist of the National Association of Manufacturers in Washington, D.C.



* Figures are seasonally adjusted and use 1982 dollars

Because of this weak economic growth, economists say, the increase in business capital spending — the key economic indicator for sales of computer systems — will be delayed until 1987. Business uncertainty over the economy's future and tax reform, which is likely to kill the investment tax credit and reduce depreciation benefits, are causing the weak growth in business investments, they say.

Nigel Gault, senior economist with Data Resources, Inc. in Lexington, Mass., says the growth rate for business investments in equipment is likely to drop to about 3.5% in 1986, from 20% in 1984 and 10% in 1985 (see chart below).

"This is to be expected at this point in the business cycle. In computers, it's a breather as companies take time to absorb all of the spending that has been done over the last few years," Gault says. He predicts a modest increase in equipment investments in 1987, assuming an improvement in the trade deficit fuels U.S. economic growth next year.

"My guess is that capital spending will continue to be sluggish for at least the next couple of quarters, maybe picking up slightly toward the end of the year, with a very mild recovery next year," says Robert A. Kavesh, economics professor at New York University's Graduate School of Business Administration.

Because computer investments are discretionary, the computer industry's recovery may lag behind that of the general economy's by a quarter or two, Kavesh adds. "Unless profits improve more than I think they will, I think businesses will go slow on computer upgrading or capacity increases," he says.

IBM and Honeywell, Inc. recently blamed their depressed earnings reports on weak business spending in the North American economy, although Burroughs Corp. and Apple Computer, Inc. reported increasing sales [CW, July 21].

Industry analysts note that the soft economy is not the only reason for the computer slump. Excessive additions to computer capacity in 1983 and 1984, the lack of complete system integration and lengthy corporate acquisition procedures also have hurt sales, according to the July research report by Alex Brown & Sons of Baltimore.

The analysts say that these market factors should wane over the next six to 12 months, while the economic recovery begins in early 1987 and sets the stage for a pickup in capital spending.

3Com rolls out Token-Ring products including Ethernet software links

By Peggy Watt

MOUNTAIN VIEW, Calif. — Staking its claim to the increasingly crowded token-ring local-area network market, 3Com Corp. today is expected to formally unveil its promised line of network products compatible with IBM's Token-Ring. The products include software to connect token-ring and Ethernet network systems.

While 3Com acknowledges it faces a challenge in a market already occupied by the standard-setting IBM configuration and by Novell Corp., whose software was recently endorsed by IBM, analysts and network consultants say that they welcome competition in the token-ring arena.

"It's not like IBM has a hold on all the organizations that are thinking about networks," says Gabe Kasperek, data communications consultant with Kazcom, Inc. in Park Ridge, Ill. "Right now, I don't know if it can get any more competitive in the Ethernet area. But there's still some room to grow in the token-ring market."

> *'We're not saying token-ring is better. We intend to provide products with all kinds of media. We always want to offer an option.'*
>
> — Bridget McNiel 3Com Corp.

For its part, 3Com is emphasizing that it is not abandoning Ethernet.

Through 3+ Netconnect software, scheduled to ship in September, and Token Connection for 3Server, 3Com will offer a bridge between several token-ring networks or a token-ring and an Ethernet system, says Bridget McNiel, product manager.

It includes two serial ports and an Appletalk connector to also link Apple Computer, Inc. Macintosh systems into the network.

Tokenplus products

3Com's Tokenplus products, which meet IBM and IEEE 802.5 standards for token-ring configurations, include the $1,095 Tokenlink Plus adapter card for an IBM Personal Computer or compatible, the $1,295 Token Connection expansion card for 3Com's existing 3Server Ethernet file server, a cabling system that features Ringtap connections, varied-length shielded twisted-pair cable, connectors and links to the IBM cabling system.

Versions of 3+ Netconnect software, due out in September and priced at $1,250, will support the 3Com 3Server running Ethernet as well as IBM's PC Server. The server software can also run on an IBM Personal Computer AT, McNiel said.

The company used Texas Instruments, Inc. TMS 380 chip set to ensure IBM Token-Ring compatibility, McNiel added.

The Tokenlink Plus adapter has an Intel Corp. 80186 10-MHz microprocessor and 256K bytes of random-access memory.

The product currently supports 3Com's network operating system 3+, which runs most applications written for the IBM PC Network program Netbios.

By year's end, 3Com will offer a full Netbios implementation in 3+ and as a separate product, according to Douglas Pollack, 3Com director of marketing.

A Tokenplus Starter Kit is available for $3,755 and includes three Tokenlink Plus adapters, three Ringtaps and cabling accessories and the Network Administrator's Guide for the Tokenplus network (sold separately for $50).

3Com's token-ring uses an external bus topology for easier connection, but retains the ring operations.

Through the Ringtap connection, the server or an individual workstation can connect to the token-ring media.

Token-Ring requirements

IBM's Token-Ring configuration requires cables running from the workstation to the wiring closet and then back to the next workstation.

3Com's package includes trunk cables of varied lengths, extension cables and loopback plugs for each end of the network. 3Com and IBM token-ring networks can be connected via a 3Com-supplied cable link to IBM's Multistation Access Unit.

McNiel said 3Com will promote its cabling system as a less expensive configuration than IBM's, which comes with eight connections and only becomes cost-effective as more of them are used.

The 3Com system requires a $95 Ringtap connection for each unit, so that they can be added as needed.

McNiel said the token-ring system will complement, not compete with, 3Com's established Ethernet system.

"We're not saying token-ring is better," she explains. "We intend to provide products with all kinds of media. We always want to offer an option."

IBM endorsement

Pollack said he is not worried about IBM's endorsement of Novell's Advanced Netware, pointing out that the recent bundling agreement covers resale only by IBM's educational products division.

"That's rather a specific application market and not 3Com's," he said. "People choose different systems for different reasons. We can offer a strong partnership for all network products." He expects that some dealers may choose to mix and match components from different vendors.

But 3Com will have to hit the ground running, especially considering that the Ethernet-to-token-ring connection will not become available until fall, says Ronald Kopeck, president of the consulting group, Edgetech Associates in San Francisco.

"I think they've got some catch-up to do," he says. "3Com had to come out with a token-ring if it's going to be a main player. But Novell is being very aggressive. 3Com has to beef up its image in the market."

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OSI substitute lures net users

From page 1

ity as well as file exchange capabilities.

TCP/IP was originally developed for the U.S. military's Arpanet network and is a prerequisite for all government and military contracts.

"We're aware of what's going on in the OSI world, but the protocols are just not a reality for the kinds of computer applications we're doing," says Tom Jacobson, director of communications for Minneapolis timesharing firm Minnesota Supercomputer Center, Inc. "In terms of functionality, OSI is currently where TCP/IP was in 1980."

TCP/IP is used as a transport vehicle between Minnesota Supercomputer's Cray Research, Inc. supercomputers and a wide variety of user systems from Data General Corp., Digital Equipment Corp., Sun Microsystems, Inc., Pyramid Technology Corp., Apollo Computer, Inc., Calcomp, IBM and Silicon Graphics, Inc., Jacobson reports.

All of the vendors except IBM provide their own TCP/IP support; the IBM mainframe connection is provided through a channel interface from Fibronics International, Inc. subsidiary Spartacus Computers, Inc.

TCP/IP protocols have been commercially available for more than a decade. "The only advantage to OSI is greater vendor support; the computer companies support TCP/IP grudgingly, while OSI is mainline for them," Jacobson says.

Still, computer and network industry support for TCP/IP continues to grow and with it the range of multivendor systems that can use the protocol to communicate over either a long-distance or local-area network TCP/IP is becoming the common interface between a growing number of network applications and computer systems: most recently, the IBM Personal Computer.

Once TCP/IP is linked with Netbios — software that enables IBM PC software applications to transmit over an IBM PC Network or Token-Ring — the wide range of applications written for Netbios will also be able to run on a TCP/IP network

"You'll be able to take a Lotus spreadsheet, and use TCP/IP to transmit it anywhere on a local or wide-area network," says Harvey Freeman, vice-president of Minneapolis consulting firm Architecture Technology, Inc.

Through Netbios, TCP/IP will also be able to interface with networking software such as 3Com Corp.'s 3+/Share and Novell, Inc.'s Netware.

"I recently got into an argument with a National Bureau of Standards representative who said that OSI will supersede TCP/IP," Freeman says. "Given the rate at which manufacturers are shipping TCP/IP, by the time OSI arrives, there will be a lot of people who will decide they don't need it. They won't drop a de facto standard just because the 'real' standard is here."

> ***'We're aware of what's going on in the OSI world, but the protocols are just not a reality for the kinds of computer applications we're doing.'***
>
> — Tom Jacobson
> Minnesota Supercomputer Center, Inc.

Freeman predicts that TCP/IP and 'OSI will coexist, with networks supporting the two protocols linked via a gateway "just as Systems Network Architecture and OSI will coexist. Just as SNA is too entrenched for people to change now, TCP/IP has an extensive installed base in the commercial market. Plus, it has all those Department of Defense users. It would take 10 or 15 years for them to agree to change anything," Freeman says.

"People thought that TCP/IP would fade and die when OSI was ready; instead, the protocols have gained even wider acceptance this year," says William Carrico, president of network vendor Bridge Communications, Inc. Eighteen months after they were first introduced, TCP/IP products currently make op a third of Bridge's shipments, he notes.

The recent burgeoning of the TCP/IP market has fostered a new round of TCP/IP product introductions that are likely to accelerate the protocol's acceptance still further. Chief among these are interfaces that enable other popular communications protocols — and therefore the computers and applications that support these protocols — to use TCP/IP as a common transport vehicle.

One such protocol is Network File System (NFS), a communications program that Sun Microsystems designed to work with TCP/IP. A computer running NFS can exchange files with any other system that supports the program. NFS is currently supported by more than 30 hardware and software vendors.

The other major link will be to Netbios. Currently, Netbios-TCP/IP links are few. Network vendor Excelan, Inc. offers one. Univation, Inc. and Bridge both recently announced products that implement TCP/IP on an IBM Personal Computer but offer no connection to Netbios. Their offerings thus enable PCs to use either the TCP/IP file transfer program or Netbios-based file transfer programs — but do not allow Netbios-based applications to access files on another system via the TCP/IP link.

Software interfaces such as the ones mentioned above are a key element in Minnesota Supercomputer's distributed processing strategy, in which applications are broken up into modules "that run on the system they're most suited for — whether it's a Cray or an IBM PC," says executive vice-president Robert Williams.

The company already is using an internally developed software program that allows users to perform graphics functions on an IBM PC, using data that is being edited on a Cray supercomputer. The graphics and editing applications communicate through TCP/IP.

The Netbios-TCP/IP Interface Specification Forum, to be held in Monterey, Calif., on Aug. 25-27, holds out hope for users such as Minnesota Supercomputer. Vendors and users are scheduled to discuss a proposed draft of a standard for interfacing the two protocols.

Ungermann-Bass, Inc., Bridge, Excelan, Communications Machinery Corp., Mitre Corp. and Sun Microsystems, Inc. are among the TCP/IP network vendors sending representatives to the meeting.

"Standardizing the interface would guarantee interoperability between computers equipped with different implementations of Netbios on top of TCP/IP," Mitre spokesman Paul Brusil says.

Excelan product manager Jay Weihl reports that a number of the vendor's customers "have raised the issue of linking TCP/IP and Netbios." Excelan is willing to modify its current product to conform to the standard, he adds. "We want very much to promote the standard. Right now, our product and someone else's Netbios-TCP/IP solution won't communicate."

Minnesota Supercomputer's Jacobson will be among the users attending the conference. "We're in favor of any move towards standardization," he says, adding that he expects when OSI finally comes along, "migration from TCP/IP will be an easy, transparent job. In about three more years, we envision running OSI and TCP/IP protocols side by side on the same system."

Cullinet buys into VAX DBMS mart

By Charles Babcock

WESTWOOD, Mass. — Cullinet Software, Inc. is making a bid to become a supplier of data base management systems for Digital Equipment Corp.'s VAX line and will soppiy products to that line with its own version of IBM's SQL.

Cullinet is moving into the DEC arena through the $8.4 million acquisition of Esvel Co. of San Jose, Calif., which produces a DBMS for DEC VAX systems that is sold through OEMs. A Cullinet apokesman said Esvel President Kapoli Eswaran is a relational technology expert who worked on IBM's System R project, the predecessor to IBM's DB2 relational DBMS.

"We have bought both the product and the expertise of the company. It will function as a development organization," said James G. Blake, vice-president of communications at Cullinet.

Cullinet officials added that their long-range goal is to become a vendor of minicomputer as well as mainframe DBMS. Once this is achieved, officials said last week, Cullinet can pursue cooperative processing strategies using applications that work together while running on different machines.

Future possibility

Robert Robinson, director of systems and computer services for DuPont of Canada in Quebec said his company uses DEC VAX systems at manufacturing sites that are independent from the mainframes at the corporate data processing center. At present, there is no need to implement cooperative processing between the two, Robinson said, bot company officials have discussed it as a future possibility. "The future is regarded as being six months out," he said.

Esvel also develops DBMS for the IBM Personal Computer, prompting industry observers to note the possibility that Cullinet may someday offer products allowing PC users to access data on departmental and mainframe systems.

Cullinet is not the first mainframe software supplier to move in this direction, but it is potentially the largest one. Cincom Systems, Inc. in Cincinnati has found a growing market for its manufacturing and accounting software that runs on the VAX line, and Information Builders, Inc. in New York has ported its Focus fourth-generation language and DBMS to the VAX and the IBM PC.

But Cullinet is a larger player than these companies, and its marketing prowess is respected. Its 125-person direct sales force is six times the size of Esvel's total roster.

The acquisition also underscores Cullinet's growing commitment to SQL. It will announce this fall a version of its mainframe DBMS, IDMS/R, that will support SQL, and later announcements will outline support in Ads/Online, its application development language, and in its Data Manipulation Language Cobol for SQL, Blake said.

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How Discussions in Software Productivity.

NBI laser printer aimed at desktop publishing opportunity

Offers Postscript fonts, networking capabilities

By Eddy Goldberg

BOULDER, Colo. — NBI, Inc., in a stepped-up effort to expand its presence in the growing electronic publishing industry, will begin marketing its own laser printer early in the fourth quarter of this year.

The NBI 908, an 8 page/min desktop laser printer, will be priced at $6,995 and support the use of Postscript, an emerging font standard from Adobe Systems, Inc.

The NBI 908 is targeted for use with NBI's Integrated Workstation (IWS) in desktop publishing environments that require the integration of text and graphics with near-typeset-quality output.

IWSs linked via Peripheral Connection

Multiple IWSs will be connected to the 908 through NBI's Peripheral Connection, which allows a data transfer rate of 1M bit/sec. over a standard twisted-pair telephone wire network.

Devices linked through Peripheral Connection can be up to 1,000 feet apart. Peripheral Connection boards, which are installed in each IWS, will cost $1,000 each.

The NBI 908 is based on the Ricoh Corp. 4080 printer engine, and it uses a proprietary raster image processor that allows printing of a full 8 page/min through the Postscript interface, according to Mary Coleman, director of the Office Systems Division of NBI.

NBI's proprietary raster image processor uses an MC68000 processor from Motorola, Inc. with 2.5M bytes of random-access memory, which is enough storage for two full 8½- by 11-in. pages at 300 dot/in., Coleman said.

Concurrent page building

This capability allows a second page to be built up in the Postscript page description language while the first is being dumped to the printer, resulting in a full 8 page/min., Coleman said. In addition, dedicated direct memory access chips are used to off-load I/O tasks from the 68000 chip, resulting in improved data transfer between the processor and memory.

Coleman said the increased memory capability plus the direct memory access chips make the NBI 908 significantly faster than competitive laser printers.

Other features of the printer include a recommended duty cycle of 5,000 pages per month and a printer life of 600,000 impressions.

It also includes a 250-page paper tray with copies delivered face down in correct sequence.

TOP OF THE NEWS

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in the 3610AE and scheduled for October availability. The new systems could be available by year's end.

The 3620 is expected to be priced between the 3610AE and 3640, which sell for about $40,000 and $60,000, respectively. The 3650 will sit between the 3645 and 3670, which sell for approximately $70,000 and $110,000. Price cuts on existing systems are also expected and so is, perhaps, an improved link to standard architecture machines.

■

Javelin Software last week removed copy protection from Javelin 1.1, the latest version of its $695 microcomputer business analysis and reporting software package. A copy-protected version of the software for firms concerned about employee software piracy will be made available through Javelin's corporate software licensing program.

■

Sperry is currently developing four different CMOS chip sets that will employ its full 1100 series architecture on a single board. Future products from this technology will be the Swift system, operating at up to 3.6 million instructions per second (MIPS); the Liberty I and II, operating at speeds from 1.3 to 8.5 MIPS; and the Saturn, at 5 to 18 MIPS. Sperry's plans call for current 1100/60 to 1100/70 users to migrate to Liberty and then to Saturn.

For current 1100/90 users, the planned growth path leads to the custom bipolar chip-based Mercury. Mercury is targeted to operate at 25 MIPS in a single processor, with up to six processors configurable at a site.

■

Apollo Computer, which has never sold third-party software directly to its customers, plans to market the latest version of Interleaf, Inc. electronic publishing software, WPS.C, because "It is a key product and best offered that way," a company spokesman said.

"We've been working on this contract for nine months now," an Apollo spokeswoman said. Interleaf's WPS is sold by a number of hardware vendors, including IBM and DEC.

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□ REASON #2: ARRAY PROCESSING OPTIMIZES ACCESS TO LARGE SETS OF DATA.

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□ REASON #4: MULTI-TABLE CLUSTERING OPTIMIZES JOINS.

ORACLE stores data from different tables on the same physical disk page. This technique—called *multi-table clustering*—permits you to access data from multiple tables in one disk read operation. Clustering improves ORACLE performance on all multi-table operations, such as join queries, update transactions, etc.

□ REASON #5: HIGH-SPEED RELATIONAL SORT FACILITY OPTIMIZES DATA AGGREGATION

Ad hoc relational queries frequently request that data be grouped, ordered or otherwise sorted. V5's internal sort facility performs aggregation and elimination early, faster than previously thought possible.

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Sacramento ..... Jul 22, Sep 30, Oct 30
San Diego ..... Aug 7, Oct 7, Nov 6
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San Jose ..... Aug 7, Sep 23, Oct 21, Nov 13
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CT Hartford ..... Sep 10, Oct 22, Nov 13
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WA Seattle ..... Oct 23, Dec 11
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Third-party supplier charges DEC with antitrust violations

Suit claims DEC fosters illegal tie-in policies

By Donna Raimondi

Increasing resentment over Digital Equipment Corp.'s closed architecture and bundling policies boiled over last week when the company was charged with antitrust policies by a third-party supplier of DEC-compatible products.

System Industries, Inc., a Milpitas, Calif., manufacturer of disk and tape storage subsystems and clustering schemes for DEC VAXes, filed charges of federal and California antitrust violations in the San Jose, Calif., U.S. District Court on Wednesday.

The suit claims DEC fosters illegal tie-in arrangements that force DEC computer buyers to purchase peripherals only from DEC. The effect of the tie-in arrangements, System Industries claimed, is to deprive DEC customers of equipment available at lower cost from the claimant and other independent suppliers.

The suit does not appear destined for success, one analyst said. "It is DEC's box, and they can do what they want with it," said John McCarthy, research manager at Forrester Research, Inc. in Cambridge, Mass.

The suit reflects DEC's desire to keep business in a tightening market. "When the vendors were growing at 30% a year, it wasn't a problem to have so many OEMs and third parties. But now people are tripping over each other to get sales," he said.

"We have not been served with the papers," a DEC spokesman said last week, "but System Industries' allegations in the suit are a complaint about Digital's policy to enforce vigorously its patent rights. The key issue for Digital is that System Industries has infringed some of our patents. We have a patent suit against System Industries filed in 1980 in Boston Federal Court that should come to trial in 1987. As part of that suit, System Industries filed typical antitrust counterclaims."

Third-party vendors were split as to whether or not DEC's practices are unfair. "We have claimed that DEC engages in blatant violation of antitrust laws. We feel that DEC uses illegal equipment tie-ins, whereas they will only sell their CPUs if the customer agrees to buy their storage equipment," said Michael Lewis, chief financial officer at Emulex Corp., which manufactures storage subsystems and controllers for DEC equipment and other markets.

Emulex has antitrust suits pending against DEC. The suits, filed in September 1985, are in response to litigation from DEC against Emulex for patent infringement.

"We also feel that DEC is dealing in bad faith with misuse of patents. DEC obtains patents just to eliminate competition, and not when there is technological innovation. DEC is using the legal system to ensure market penetration, and we don't think that is what the system is for," Lewis charged. "The key issue with both Emulex and System Industries is that our patents have been infringed," the DEC spokesman said. "We are using the legal system to protect our patents."

Forrester's McCarthy noted that while DEC probably will not be hurt by the various lawsuits, it may be unfortunate that DEC is causing so mucb unhappiness in the OEM community. "You don't want to forsake the people who helped you get where you are," he said.

Robert Newton, vice-president of Peripheral Services, Inc., a Dallas systems integrator, said that DEC's policies do not impact third-party vendors in a harmful way. "We have customers who want pure DEC integrated systems, but we also have customers who want other third-party equipment, and we don't have any problem serving either of them," Newton said.

Chip triggers software race

From page 1

The vendors are Gold Hill Computers, Inc.; Franz, inc.; Arity, Lucid, Inc.; Quintus Computer Systems, Inc.; and Teknowledge, Inc. The following week, Gold Hill Computers of Cambridge, Mass., should introduce for existing personal computers an 80386-based add-in board bundled with Lisp development software for producing and running large artificial intelligence applications.

Ultimately, the speed and power of the 80386 will permit vendors to produce IBM Personal Computer AT-compatible machines whose performance rivals that of superminicomputers. Among the new chip's most advanced features are a potential 20-MHz clock rate, the ability to address 4G bytes of main memory and on-chip memory management.

According to 80386 marketing manager Dana Krelle, Intel began shipping the 80386 in mid-July and plans to produce 100,000 of the chips this year.

Not available until 1987

However, most of the 80386-related products under development are not expected to be available until at least early 1987. Therefore, despite plenty of enthusiasm on the vendor side, some potential users contacted by *Computerworld* said they do not yet need the extra capability represented by 80386-based machines.

While Softguard's operating system is patterned after the VM operating system and code-named VM/386, it is not compatible with VM in any way. Rather, it functions as a host to other operating systems much like VM and incorporates VM-like features such as multitasking and virtual memory. This reportedly allows one 80386-based system to host several virtual machines, each of which can run a separate operating system without software modifications.

"We are providing established mainframe features to the 80386 users," claimed Joe Diodati, Softguard Systems' vice-president of marketing and sales. "The goal of VM/386 is to provide virtual memory and multitasking to the existing PC marketplace without requiring users to change anything."

According to Diodati, VM/386 supports multiple terminals and can also run with 80386-based file servers and 80386-based accelerator cards that plug into an IBM PC AT.

Because it allows multiple operating systems to run concurrently, VM/386 bears a resemblance to the AT&T Information Systems' Simul-Task operating system, which presently runs on 80286-based systems. Simul-Task's developer, Locus Computing Corp. of Santa Monica, Calif., is preparing a version of the operating system for 80386-based machines.

Simul-Task runs IBM's PC-DOS as a task under Unix. However, Diodati claimed that VM/386 is markedly different in that each operating system running under the environment is completely separate from the other.

'Risky venture'

Analyst Tim Bajarin of Creative Strategies in San Jose, Calif., cautioned that Softguard's venture may be risky, because IBM may be developing a VM-compatible operating system for PCs built around the 80386. Bajarin predicted IBM will be bringing out its new machine by late 1987.

Microcomputer users at Insurance Services Office, Inc. in New York currently have no need for a system utilizing the 80386's power, according to Thomas Lee, assistant manager of the data base services division. Proponents of 80386-based systems claim many power users need faster machines for applications such as the recalculation of large spreadsheets, but Lee said that is not the case at his company. Insurance Services Office currentiy uses a mix of IBM PCs, PC XTs and ATs.

However, some technical users should benefit from the 80386's increased power. "Anxiously awaiting" the arrival of the new class of PCs is L. David Roper. Roper is in charge of microcomputer purchasing in the physics department at Virginia Polytechnic Institute & State University in Blacksburg, Va.

While his department primarily runs Microsoft Corp. MS-DOS applications, Roper expects his department to become heavily involved in Unix on 80386-based systems and to take advantage of the multitasking capability for MS-DOS applications as well.

Softguard plans for VM/386 to be bundled with 80386-based systems and add-in boards by year's end or the first quarter of 1987. Diodati said a retail version of the operating system should be on the market in the second quarter of 1987 for approximately $170.

Gold Hill Computer's board, called the 386 Hummingboard, along with its GCLisp Developer and 6M bytes of random-access memory, will be priced at $7,000. The board is scheduled to be available in three months.

Revamped PFS line offers site licensing, file share options

Software Publishing keys on business users

By Peggy Watt

MOUNTAIN VIEW, Calif. — By announcing an enhanced line of its popular PFS products and a corporate site licensing program to help sell them, Software Publishing Corp. last week aimed straight for the corporate market and, it hopes, out of its financial doldrums.

The company says it is counting on the new line and the new market to pull it out of the financial slide that started in the past year, during which both profits and sales fell. Most recently, President Fred Gibbons warned shareholders that a $2.5 to $3 million pretax loss may come in the third fiscal quarter, which ended in June.

The PFS:Professional series introduced last week includes PFS:Professional Write, PFS:Professional File and PFS:Professional Plan, as well as PFS:Professional Network, which allows file sharing and other networking features among the new applications.

At Wells Fargo Bank in San Francisco, some 250 users are eager to jump from the PFS line they've used for years to the PFS:Professional products they've been testing, said Kingsley Mar, manager of research and development for the bank's systems resource management group.

"The PFS products were perfect to get people up and running, but as their expertise grew, their needs for power were increasing," Mar said. Because of similarities between the older and new products, he said, little retraining is required.

The site licensing policy allows unlimited disk duplication and reproduction of the manual for $75,000 for any single PFS-brand product and $100,000 for either of Software Publishing's existing high-end Harvard series products, Harvard Presentation Graphics and Harvard Total Project Manager, said Janelle Bedke, vice-president and general manager.

Licensees also receive a year of technical support, notes and information and eight hours of training for the corporate training staff. Upgrades of 10 or more copies of a program will be available through a central exchange, either from dealers or directly through Software Publishing, and at a standing 40% discount of the standard upgrade price.

Businessland, Inc. Chairman David Norman said his retail stores expect a good market for the enhanced PFS line.

"The packages from Software Publishing are dead on," he said. "Many middle managers do not need all this power, but they do need to be computerized." He said the ready networking capabilities are also welcome, estimating his stores install 100 local-area networks every month.

Available immediately are PFS:Professional Write, priced at $199, and PFS:Professional File for $249. The other two products are scheduled to be available before the end of the year, according to Software Publishing. PFS:Professional Plan will be priced at $249, and the network adapter that handles up to five users of a single PFS application is priced at $499.

The site licensing plan would not be economically advantageous unless a corporation wanted at least 301 copies of the $249 packages or 377 copies of the cheapest, the $199 PFS:Professional Write. Several industry observers noted the PFS:Professional Network terms were too stringent in forcing customers to buy another copy of Network for each application program they wanted to run.

Getting the most from the mart

"To make the three products run multiuser among five users, you have to spend $1,500 just for the networking software," said Amanda Hixon, software analyst and editor of "P.C. Review," a Felton, Calif., software evaluation newsletter. "It almost seemed that with the networking feature, they were saying, 'We've got a new market, let's see what we can get.'"

The PFS:Professional line products can read files from Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase III Plus, as well as exchange data under the IBM Document Content Architecture and ASCII format for micro-to-mainframe communications.

All the programs reside on a single disk and run on a dual-floppy IBM Personal Computer or compatible system. None are copy protected. The programs also run under both Microsoft Corp.'s Windows and IBM's Topview.

By introducing a $149, low-end integrated package also based on the PFS line, called PFS:First Choice, Software Publishing hopes to retain and expand the entry-level, low-cost audience it cultivated so successfully with the original PFS products. First Choice includes a word processing program with spelling checker, file management and report writing system, spreadsheet and communications capabilites. It is scheduled to ship in August.

PFS:Professional Write includes a spelling checker and thesaurus; an internal address book for mail-merge functions; a limited, line-drawing graphics feature; and block editing. PFS:Professional File uses memory caching, cross-tab report functions and a mailing label printing program. PFS:Professional Plan includes analytical graphics, a recalculation feature and 94 key word search functions.

Copyright suit: Violations or sour grapes?

By Edward Warner

NEW ORLEANS — The complexity of the software copy protection issue was illustrated recently when an expert witness in a copyright suit claimed he could easily undo Vault Corp.'s copy protection scheme.

Vault's protective code is based on a small scrape made in a specific place in the diskette's media. With needle in hand, the expert tried repeatedly to imitate that scrape, but none of his punctures landed in just the right place, much to the relief of Vault's President W. Krag Brotby.

Brotby is suing Quaid Software Ltd. of Toronto for $100 million on the grounds that Quaid's Copywrite software violates the copyright on Vault's Prolock program.

Software manufacturers use programs such as Prolock to protect their software against illegal copying — a practice that costs the industry between $600 million and $800 millioo annually, according to a Future Computing, Inc. study.

Prolock protects software by not permitting a copy to be made unless a small scrape is detected, which the software vendor has placed on the surface of each program diskette according to Vault's apecifications. Copywrite, however, makes Prolock sense a nonexistent scrape, allowing users to make as many copies as they want.

The suit, brought uoder the state of Louisiana's stringent software protection laws, has dragged on for a year and a half but may soon reach a conclusion.

The situation has changed a great deal since 1984 when Prolock was used by several major software vendors, includiog Ashton-Tate which used the product to secure its software from piracy.

The exception rather than the rule

Software copy protection is now the exception rather than the rule: Many software vendors, including Microsoft Corp. and Software Publishing Corp., have dropped their copy protection schemes because of user complaints that copy-protected programs could not easily be installed on hard-disk-equipped personal computers.

Vault, meanwhile, has sought protection under Chapter 11 of the Federal Bankruptcy Code, a situation that Brotby said he blames on the impact of programs such as Copywrite. Vendors, according to Brotby, lost their desire to license copy protection software for use in their own programs when they saw how easily the code could be broken.

The use of copy protection declined also because customers wanted to make backup copies in case their original copy was lost or destroyed. According to Quaid Software President Robert McQuaid, Copywrite is used largely by law-abiding customers making backups; when Copywrite has been used by pirates, McQuaid said, he has never failed to inform the police.

The issue at hand

Brotby, however, argued that software licenses do not permit the making of backups. Furthermore, he contended, it is copyright violation — not software piracy — that is at issue. According to Brotby, a portion of Copywrite, called Ramkey, copies and modifies some of the Prolock program in order to defeat it. "Every time a Ramkey is used, it modifies Prolock code" and violates Vault's copyright, Brotby claimed.

McQuaid, however, contended the offending program was taken off the market two years ago and that the latest version of Copywrite only simulates the Vault copy protection method. "Our Copywrite software doesn't contain his code," McQuaid said.

In broader terms, though, Brotby said he believes the suit will decide the fate of copy protection in the U.S., and, if copy protection disappears, then investors will no longer want to pour money into small software start-ups, and the U.S. software industry will be crippled. "With the gatekeeping technology and the intellectual innovation in jeopardy, it won't be long before the complete technological package, as well as the industry that supports it, will be in jeopardy," he charged.

McQuaid, though, claimed the suit is nothing more than sour grapes on Brotby's part. According to McQuaid, Vault lost its lucrative contract with Ashton-Tate six months after Copywrite's arrival in mid-1984. "Brotby thinks I cost him his $50 million business," McQuaid said.

World Digest

Star Wars foes strike

TOKYO — "1,600 researchers say 'no' to Star Wars plan," read a headline in the July 6 issue of the *Japan Times*. Those who said "no," the article explained, work in Tsukuba, Japan, the "Science City," located some 60 kilometers northeast of Tokyo. They signed a petition against Japanese involvement in U.S.' Strategic Defense Initiative, or Star Wars.

Those who signed the petition included some 1,200 people from nine research institutes of the Governmental Agency of Industrial Scieoce and Technology and others who worked in local busioesses. The petition said that Star Wars was nothing more than a disguised program for arms expansion.

Super weather forecast

TAIPEI, Taiwan — To be better prepared for the devastation wrought by hurricanes, Taiwan's Central Weather Bureau reportedly plans to buy a Cootroi Data Corp. CD 205 supercomputer. Delivery is slated for the beginning of next year. In March, the weather bureau bought a CD 840 mainframe, which is currently being tested and is scheduled to go into full operation with the arrival of the supercomputer. Chinese-language software is being developed by the government's Institute for the Information Industry.

Information compiled from the Computerworld International News Service.

Empire State Games tracks Olympic competitors on-line

Coordinates results with Prime network

By Donna Raimondi

BUFFALO, N.Y. — The Empire State Games, started in 1978 to improve amateur sports in New York state, have become an important pre-Olympic training ground. When this year's games begin Aug. 6, a networked system of computers will be in place to coordinate data on thousands of participants and to accurately report game results. Initially, a single volunteer with a Tandy Corp. personal computer tracked the up-to-6,000 game participants per year — competitors who need to keep motivated and in shape between Olympic competitions.

By 1985, the growing games needed an automation chairman. "Nobody really knew what that meant, but my boss volunteered for it," says Ken Latt, vice-president in charge of technical services at Goldome bank in Buffalo and the man in charge of this year's automation efforts.

Latt is overseeing a loaned, networked system of Prime Computer, Inc. systems that includes two 2655 superminicomputers, 20 PT 200 terminals, four Tally impact printers, two laser printers and seven Prime personal computers. He works closely with programmers donated by Prime and the Computer Task Group, a Buffalo concern that has volunteered to write software for the games for the past two years. The programmers are using Prime Information, a Pick Systems Pick-based software system that makes it easy to create the menus needed by the games' data entry volunteers, he says.

Nationwide program

The competitions became so successful that New York went into the 1984 Summer Olympics with a disproportionate share of Olympic contenders, says Michael Abernathy, executive director of the Empire State Games. That success led to Olympic Committee recognition and the beginning of a nationwide program that so far includes 30 states.

Just as the games grew state by state, the technology to enhance the games in New York expanded past the one person, one personal computer of two years ago. Last year, AT&T donated two of its 3B2 minicomputers to track participants and game results. But for the 1986 games, services will go beyond simple record keeping. Local and statewide news services have requested results in formats that are usable to newspapers, and the automation committee says it believes it will get more press coverage if it can provide those results.

The Prime system, housed initially at the Goldome bank and scheduled to be moved by July 30 to the Center for Tomorrow at the University of Buffalo — the games' media center — is connected via the Prime Link networking software to the six Prime PCs that are in each of six regional games offices.

The regional directors keep track of data on game participants, including names, addresses, emergency telephone numbers and the sport or sports in which each participates. That information is transmitted to the central computer.

Gain in time

"The system, which we have had since April, gives us a tremendous gain in time," Abernathy says. "It gives us time to get out promotional material on who is qualified for what and to organize the housing, which is a major task for 6,000 participants. To get each and every one of them into a bed and assigned to a dining cafeteria is a major task."

When the games start, AT&T facsimile machines will transmit results from the game sites to the center for the five days of events. Auditors will check the data for accuracy and give it to the volunteer data entry people for inputting. At this point, reporters at the center can query terminals for information on any participant or any of the 27 represented sports. Printers will be hooked up so that reporters can get paper copy of whatever results they want.

Display stations will put out both official and unofficial results at all times, "sort of like airline departure/arrival terminals," says Theron Howard, manager of technical training at Goldome and the games' training director.

The information given to newspaper reports will be in agate-type format, Howard said. "We try to give the Buffalo press, Associated Press and United Press International their data in the best possible format that is acceptable to them. There is a stylebook out for all sports that we are going by."

To make this system possible, Latt had to arrange for donations from a number of vendors. Digital Equipment Corp. and Computerland Corp. loaned printers for the PCs; IBM donated two duplicating machines; Xerox Corp. donated copiers at five different sites; AT&T lent the facsimile machines; New York Telephone Co. provided telephone services and CSC Advanced Systems in Buffalo donated the modems. "And we keep it all running," Latt adds.

VIEWPOINT

EDITORIAL

We'll manage

The worst thing you can do, says one MIS executive, is take a good technician and force him to become a crummy manager.

We agree. But we also believe that the time has arrived for MIS professionals to realize that even the highest management positions are not beyond their skills or reach. In fact, the opportunity for managers with solid technical backgrounds has never been better. As corporations recognize MIS as an important and even favored business function, they are apt to look more and more to MIS as a pipeline to the top.

What this means for those systems people with an eye to the future is that the time is right to develop management credentials. Major corporations, from Avis to Zenith, are spending millions on in-house management training for their technical people. This week's Executive Report explores how such companies are tackling head-on the well-worn stereotype that says it is impossible to teach people skills to technicians.

IBM, for example, spends more than $900 million annually on in-house training for its employees and has required courses for every level of MIS management, both new and experienced, which focus strictly on management skills. Manufacturers Hanover Trust Co. sends technical people to such renowned institutions as Harvard and Stanford universities for extended management training courses.

These technicians were saddled with the same cliched personality traits as anyone else in MIS — too analytical, lacking in social skills, inept communicator — and are making the transition into management with success. The newest generation of technologists will have no such transition; many take management courses as part of their computer science degree program. They enter the field believing that management is a brass ring to be grabbed, not a torture to be avoided.

Those already in the field should adopt a similar philosophy. Granted, managing others is not for everyone. We heartily applaud companies with the insight to invest in dual career tracks for valuable systems people who simply do not want to be leaders. But we also encourage those in MIS to look upon management as an opportunity, not a liability, a chance to leverage vital technical skills into a first step up a once-inaccessible corporate ladder.

Notes & observations

Speaking of the new generation of computer professionals, those at Harvard are purported to find the life of a computer major "pretty gray." This is the word from the *Confidential Guide* to Harvard courses, an unofficial but highly authoritative annual tome. The "Confi" guide elaborates by noting that "because of the high-paying jobs readily available in the computer field — some don't even require graduate study — few computer scientists are attracted to teaching positions, and the College must rely on undergraduates to fill the teaching fellow posts." The positive side to this, the guide says, is that "when you graduate, it is likely that you'll have more than one invitation to move out to Silicon Valley." Computer types are invited to "start counting your chips now."

LETTERS TO THE EDITOR

Software quality data distorted

The article by David Bendel Hertz, "SDI demands trillions of instructions, 99.9999999% reliability" [CW, June 2], somewhat distorts my software quality data, if it is my data Hertz refers to.

A typical software system will accumulate a total number of from 30 to 50 defects per 1,000 source lines as the sum from all error sources: requirement defects, design defects, code defects, document defects and others.

Of this total, normal predelivery reviews, inspections and tests will usually find from 90% to 97% of the defects. Therefore, when a system is first delivered to its users, from fewer than one to about five defects per 1,000 source lines would be typical.

I have seen one product that did accumulate a total of 300 defects per 1,000 source lines over its life cycle, but even for this one, about 90% of the defects were detected prior to delivery.

Capers Jones
Chairman, Software Productivity Research, Inc.
Cambridge, Mass.

Waiting for the information czar

Regarding Ron Schneiderman's article, "Government computing: Costly, incompatible and obsolete" [CW, June 30], a national information technology advisor could not possibly promote standards that would be useful across the entire spectrum of government computer applications and would be likely to create more problems than he would solve. To illustrate, consider the following situation, with which I am familiar.

The U.S. Navy decides it needs a new headquarters budgeting system. It selects a single contractor to provide more than 50 mainframes and minicomputers, complete with modern development software, to more than 30 Navy departments. Naturally, this process takes several more years than originally planned.

In the meantime, the departments that should have received these systems have immediate information processing needs that are not being met, yet they are not allowed to "waste" funds on interim systems because they should be receiving brand-new, compatible systems "real soon now."

This example deals with just one tiny area of government computing but illustrates what could happen if a federal computer czar was given the power to "analyze, monitor, oversee and propose federal information systems." Government computing would grind to a halt while everyone waited for the czar to design some wonderful master plan that would fit everyone's needs. The result would be a Procrustean bed into which everyone's needs must fit or else.

Mark Crosby
Arlington, Va.

Productive coexistence: Cobol, 4GLs

Articles in recent issues of *Computerworld* have presented various opinions regarding fourth-generation languages' effectiveness and efficiency, risk ("Buying a 4GL: Be forewarned" [CW, June 9]) and coexistence with Cobol ("Social security down under" [CW, June 23]).

Having developing a fourth-generation language that produces Cobol source code, we remain firmly convinced that these languages and Cobol can and should coexist.

In the hands of a trained user, a fourth-generation language will provide substantial productivity gains over traditional Cobol programming techniques. However, the language may offset these gains at execution time by requiring substantially more computer resources to do the same job.

Our method of having our cake and eating it too is the fourth-generation language-to-Cobol cross-compiler, two of which we have already developed. We recommend that a fourth-generation language be used for all development and maintenance, with the cross-compiler providing the option of migrating to Cobol once the application is ready for production.

This eliminates being locked in to one language or the other and allows the DP professional to take advantage of both the productivity of the language and the proven efficiency of Cobol.

We agree with the warnings in the column [CW, June 9] that a fourth-generation language is not a substitute for Cobol when it comes to processing large volumes of data. The balanced approach described in the second article [CW, June 23] is closer to our approach, although we think the user can increase productivity further by doing all development in a fourth-generation language while having a fallback to Cobol available with the cross-compiler to ensure efficient use of resources.

Kim O. Jones
President, Forecross Corp.

VIEWPOINT

Making programs 'as simple as possible but not simpler'

"It is a simulation of the New York subway system: More than 300 stations, 20 subway lines, expresses and locals, correct transfer points, even the problems — sticky doors, track fires and occasional unsavory characters."

Bernie was describing a program he had designed to determine efficient messenger routings. "Sounds neat," his friend Jake said.

"It's great fun. You can play it like a game. But the real power of the program is in its versatility, its ability to represent practically any kind of transportation or communication system with intersecting nodes."

Jake, a systems analyst at a major government agency, reflected a moment. "I suppose you wrote it in Basic," he said.

"Sure did. And it works like a champ. The core program is less than 80 lines long. What would you have used?"

"Oh, probably C or APL, maybe Pascal — anything but Basic. The only thing good about Basic is that lots of people know it."

Days later, Bernie reflected on the discussion. He was familiar with five languages, Pascal and APL among them. He could have used one of these and picked up a few microseconds in execution speed. But he had chosen Basic for a reason, just the reason that Jake mentioned in passing: Lots of people know it.

That meant that the program could be easily used and modified, if necessary, by other people. Moreover, writing the program in a structured way with the liberal use of comment statements made it practically self-documenting. Also, the whole job including documentation and presentation to the client took just a week to complete.

Bernie does not consider himself a professional programmer. He works for a small consultant, and programming is only an incidental part of his job of solving clients' problems. Hence, in writing programs, his major concern is solving a problem effectively and expeditiously.

By DAVID H. AHL

But in many respects, Bernie is a master programmer. Consider his subway simulation program: Not only did it solve the problem, but it could be easily maintained, modified and converted to other applications. Even more important, these functions could be performed by someone other than Bernie. In a sense, the program was a supersolution because it became a new tool with which Bernie and other people could solve other problems in the future.

In contrast to Bernie, Jake works in a large programming environment consisting of many layers of programmers, analysts, mathematicians, administrators and managers. His agency, like many other government agencies and companies, sponsors professional development seminars and courses for its employees. It has a committee studying various programming productivity measurement techniques. The programming department, quite correctly, considers itself a progressive and professional shop.

Jake's agency could easily have written the messenger routing program. The client, say, a manager elsewhere in the agency, would have had to initiate the request and describe the problem completely in writing. One or more programming department managers would then determine if the program could be written in-house and, if so, when it could be scheduled. The request would then go to a technical review committee that would determine what language it should be written in, approximately how long it should take and how many programmers, analysts and writers should be assigned to the job. The job would then be scheduled.

Next, a systems analyst would look over the request in detail, conferring with the client if necessary, and hammer out an overall framework. Then, alone or with the programmer assigned to the job, the analyst would come up with a detailed approach for solving the problem and testing the solution. The program would then be written.

Another person would test it for bugs (the agency had learned long ago that programmers generally do a poor job of testing their own programs). Next, a documentation writer would work with the programmer and analyst to write the user instruction and documentation. The completed program would then work its way back up through the analyst, evaluation committee, scheduler and department management, whence it would be turned over to the client.

In summary, total elapsed time for a three-day programming job: 12 weeks. Total manpower expended: nine days. Does the program solve the problem? Yes. Is the program easy to use? Yes. Is it easy to maintain? Maybe. Is the program a generalized solution that could be used in the future? Not unless the original client request specified that it be so.

Think about your company for a moment. Is it more like Bernie's consulting firm or Jake's government agency?

Victims of dogma

Today, all too often, managers, systems analysts and programmers become victims of organization and dogma — APL is best for solving complex mathematical problems, or Pascal is better than Basic because it forces logical structure — and lose sight of the overall picture.

And the big picture is almost always the same whether it is viewed at a major government agency with 10 layers of management or a tiny consulting firm: Identify the problem, solve it in a timely way, keep the solution simple and, if possible, create a generalized tool to give you a running start in solving similar problems in the future.

Obviously, these tenets can be overdone. As Einstein said, "Everything should be made as simple as possible but not simpler." But for the most part, by keeping the big picture in sight and not getting distracted by red tape, dogma and other extraneous concerns, anyone can become a master programmer — even if he writes programs in Basic.

Ahl founded Creative Computing Magazine *and is the author of more than 20 books on recreational, educational and professional computer applications.*

Limited technology must take blame for current PC slump

READER'S PLATFORM

By PETER KAPSALES

Personal computer sales went down 7% in 1985 after a 12% increase in 1984 and a 96% increase in 1983, according to Future Computing, Inc. figures. Why? Analysts cite the following reasons:

- The data processing industry was in a slump.
- The market was saturated.
- Customers were waiting for prices to drop.
- Customers were waiting for new technology.

While these reasons may have validity, none of them explains the underlying issue for weak personal computer sales.

The issue is that PC technology is too limited to meet the needs of potential users. Users are more sophisticated today than they were in past years. Technology is not providing users with what they need for the right price; therefore, it is not selling. That is why the performance of the personal computer market was far below industry expectations.

What do PC users really need? According to Newton-Evans Research Co. in Ellicott City, Md., the nonmanufacturing applications most often implemented on micros are spreadsheet packages, 78%; word processing software, 70%; accounting, 46%; business graphics, 43%; information retrieval, 29%; personnel data, 22%; and electronic mail, 15%.

Is a PC the most effective and cost-efficient tool for each user to gain access to these functions?

Not really. The same could easily be accomplished using a multiuser system (a supermicro and/or local-area network) with four to 10 workstations. A multiuser system allows information to be shared among users, rather than isolated on a hard disk of a personal computer. Data bases, spreadsheets, and word processing documents are then accessible by many users, providing significant productivity and cost benefits. Trying to share this information using stand-alone PCs would be very costly in time and dollars.

Simultaneous access to data can be invaluable to users. Productivity improvements are often achieved when data is available only to the single user of a personal computer. But these improvements can be increased many times over when more than one user can access the information and programs. Data bases and programs are much more important to a business if they can be shared.

Many users upload and download data from mainframes or minicomputers to persoal computers. The same data is often downloaded by many PC users. This occurs only once in a multiuser environment. System and user resources are much better utilized.

The multiuser system is much less costly than having many personal computers. Only one copy of a software product is needed for multiuser systems, reducing costs and maintenance. One large hard disk is shared by users, eliminating the common practice of each PC user having his own 10M-byte hard disk (which is usually underutilized by up to 80%).

Yes, personal computers are useful, but the marketplace has stated that they are not completely filling the computing needs of the office environment. In his address at Comdex/Fall '85, Hewlett-Packard Co. President and Chief Executive Officer John A. Young said, "Customers do not want a PC. They want the gains in personal and organizational productivity that it makes possible. The PC isn't an end in itself; it's a means to an end."

Users are looking for productivity gains beyond those that the PC provides. They are starting to find these gains with multiuser systems. In the multiuser environment, the microcomputer becomes more effective as an integral part of office automation rather than a personal tool.

Future Computing reports that the number of multiuser micros installed increased 51% in 1985, and they will be more popular when additional software is available.

The personal computer market may not rebound from its performance of recent years, but a strong market for automated tools to improve office productivity still exists. Many multiuser systems are starting to evolve to meet the needs of this marketplace, and the introduction of new technology will add to the viability of multiuser systems.

Kapsales is an MIS manager and former Big Eight consultant who lives in Red Bank, N.J.

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SOFTWARE & SERVICES

SOFTALK
Charles Babcock

A tale of two IBM DBMS

The first wave of DB2 acceptance appears to have crested, and doubts once more are appearing that it will be everything IBM promises.

If it runs only with MVS/XA, then many shops are going to have to overcome the obstacles to conversion before they can implement DB2. MVS/XA and DB2 run best on an IBM 3090 mainframe, so the price of entry for some DB2 users will be a $4.5 million 3090 Model 200. And what is a devoted IMS user to do with his production data bases? Trust them to future performance improvements in DB2?

The answer, says Paul Hessinger, vice-president of research at Computer Task Group, Inc., is a qualified yes. Hessinger, a frequent lecturer on IBM software strategy, spoke recently at a Digital Consulting Associates, Inc. conference in Burlington, Mass.

Many people think that IBM's commitment to improving the performance of DB2 will gradually become the death knell of IMS. Given the advantages of a relational data base management system, DB2 will quickly overpower its aging predecessor once it has shown it can handle volume transaction processing, or so many observers think.

At this point, Hessinger's qualifications begin to surface. IBM is spending $40 million this year on IMS development and $22 million on IMS-related development. Sound like a written-off product to you?

IBM is also spending heavily to develop DB2 further. In addition to the performance improvements announced in February, IBM is working on three new releases of DB2, and it will try to compress the period between releases from 18 months into 12 months, Hessinger said.

"That means three more releases be-

See **TALE** page 22

Babcock is Computerworld's *senior editor, software & services.*

MVS network tool enhanced

Provides SNA functions, file-to-file data transfer

By Charles Babcock

This Thursday, IBM is scheduled to offer Version 2 of its MVS/Bulk Data Transfer program for moving data sets between installations on an MVS/Bulk Data Transfer network.

The transfer is effected via the file-to-file function without copying data to intermediate storage. Transfer may take place between systems at one installation or between installations on the network, according to IBM's programming announcement.

Version 2 expands the basic network functions of Version 1 to provide Systems Network Architecture (SNA) functions to JES3 Network Job Entry. A JES3 network couples independent processors together via channel-to-channel adapters and a shared direct-access storage device.

Version 2 is composed of three parts that may be ordered separately. These consist of the base function that provides interactive and transaction queuing support, a file-to-file function and JES3 SNA Network Job Entry support.

Version 2 allows a JES3 Network Job Entry site to send or receive jobs over an SNA network to another Network Job Entry site. It may also exchange commands and messages, IBM spokesmen said.

MVS/Bulk Data Transfer also provides JES2/JES3 file-to-file transmission capability using Advanced Communication Function/VTAM, data transfer checkpointing to allow interrupted file-to-file requests to be rescheduled and resumed and library capability for frequently used data transfer requests, spokesmen said.

MVS/Bulk Data Transfer will be available at a monthly fee of $800 for the base program, $575 for file-to-file and $485 for JES3 SNA Network Job Entry.

IBM has also announced Version 3 Release 1.1 of Advanced Communications Function/VTAM (ACF/VTAM) for users of MVS/370 and MVS/XA. It replaces ACF/VTAM Version 3.

ACF/VTAM Version 3 Release 1.1 offers support of Netview, a network manage-

See **MVS** page 22

SOFTWARE NOTES

Intel to market Verdix Ada system

Intel Corp. agreed to license an Ada development system from **Verdix Corp.**, a Chantilly, Va., producer of Ada compilers, debuggers, program library utilities and programming tools. Intel will market an Ada development system based on its 80286 and 80386 microprocessors.

■

Cullinet Software, Inc. has acquired a package of accounting, budgeting, forecasting and reporting facilities in the **International General Ledger System** for marketing to its overseas customers, said Vic Morris, senior vice-president of international operations.

■

Burroughs Corp. is encouraging its bank customers to switch from **Florida Software Services, Inc.** to Burroughs'

See **NOTES** page 20

Ramis II enlists in crime search

By Eddy Goldberg

CHICAGO — When the call came in reporting a car theft, the police operator queried a computer data base, asking where similarly valued cars stolen in the same area had turned up.

The system projected a possible neighborhood, and 15 minutes later, police found the car parked with the motor running. The driver had fled, Chicago police detective Charles Padgurskis recalled.

In the past, detectives had been hampered by a lack of quick access to crime records, particularly those located outside of their own precincts. Ramis II is the data base management system from Martin Marietta Data Systems of Princeton, N.J., that is helping the Detective Division of the Chicago Police Department overcome that problem.

"Ramis is very easy for a detective to use. With limited experience, he can take information and massage it into any meaningful form he wants," Padgurskis said.

See **RAMIS** page 20

INSIDE

IBM makes a special offer to encourage customers to convert to MVS/XA/**20**

NEW THIS WEEK

- Treehouse Software releases Trim Version 3.0
- Mentor Graphics offers workstation-based development tool

■ For more on these and other new products, see pp. 75-79.

INSTANT ANALYSIS

"I fully believe IBM strategy is a single DBMS, and that DBMS is DB2."

— Paul Hessinger, vice-president of research, Computer Task Group, Inc.

Ramis II enlists in crime search

From page 19

The department has compiled a data base of more than three million crime records, with approximately two million added each year. Approximately 1,000 detectives use Ramis II to access the data base.

In addition to using the system to find suspects, detectives also use Ramis II after a suspect is apprehended to see if a physical description or other evidence can provide connections to earlier, unsolved crimes.

Police Lt. John Glynn, commanding officer in the Detective Division's administrative section, described how the modus operandi used by a burglary suspect was once used to search for similar burglaries committed in the area of his arrest.

When confronted with a Ramis II printout, the suspect agreed to sign his initials to the crimes he had committed. The cases were added to the one for which he had originally been apprehended and were presented in court the next morning. After seeing the list, the judge set a higher bail.

Such success stories sparked detectives' interest, and the department formed its own Ramis II users group, Glynn said.

In another case, Padgurskis spotted a pattern in a series of burglaries. When a suspect was apprehended for a burglary that seemed to match the pattern, a set of variables was entered into the Ramis II for a search by the system. Sixty-five previously unsolved cases were found.

In each case, the suspect had delivered a pizza to the site of the burglary as a pretext for inspecting the premises. Then he gave the addresses of the most promising residences to two associates who would commit the crime when no one was home.

When shown a Ramis II-generated printout of the sites, the delivery man admitted to his involvement in all of the incidents and agreed to cooperate with the police.

Another way the system is used is to search for suspects using partial clues or witness descriptions in order to generate photographs.

Padgurskis said Ramis II is not necessarily the first tool that is used in each case, but its use is catching on. "We're making the transition from a system where everything was done by hand and hash marks to a computerized department," he said.

IBM offers free MVS/XA in conversion plan

By Charles Babcock

WHITE PLAINS, N.Y. — IBM is trying to make its strategic operating system, MVS/XA, more attractive to customers by offering it on special terms: eight months for free followed by 12 months at half price.

Customers accepting the offer must convert from a non-MVS operating system, such as VS1, DOS/VSE or VM, and pay the initial license charges at the end of the eight-month period — $12,840. But Martin H. Tillinger, president of a consulting firm that specializes in conversions, MHT Services of Hackensack, N.J., predicted, "It will get the conversion market moving faster."

IBM estimated that the offer is good for a savings of $170,000. Tillinger's estimate was higher, at $220,000.

The typical DOS/VSE shop pays $5,000 to $9,000 a month per CPU in operating system and related software charges, Tillinger said. Converting to MVS/XA will increase those charges to $20,000 to $25,000, and moving suddenly to that higher payment schedule is an obstacle for many DOS shops.

The eight-months-free offer shortens the time during which a customer would pay for two operating systems while effecting the conversion, according to Tillinger.

IBM said in a letter to customers that the offer was to encourage "direct migration to MVS/XA" and "to significantly reduce the initial expense of a non-MVS customer."

In addition, the offer is good for 15 MVS/XA-related programs, including TSO extensions, Resource Management Facility and Advanced Communications Function/VTAM.

Tillinger noted that IBM did not make the offer on any program that had direct third-party competition, such as its security package, RACF.

An MVS/SP 1.3 user, who is not eligible for the conversion offer, said most shops that wanted to convert had already done so. "This will get the fence sitters, but there aren't very many of them," he said.

Tillinger noted that IBM is making the offer not only to gain sales of higher revenue software products but also to encourage upgrades to larger mainframes. MVS/XA runs on the largest members of the 370 family, the 3083, 3081, 3084 and 3090.

Notes: DB2 users group forming

From page 19

Global Financial System by using a set of conversion tools from **Price Waterhouse & Co.**

■

A DB2 users group, called the Delaware Valley DB2-SQL/DS Users Group, is forming in the Philadelphia area. Its inaugural meeting will be at 1 p.m., Aug. 7, at the Holiday Inn on 18th and Market Streets, Philadelphia.

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Tale of two IBM DBMS

From page 19

fore the end of the decade. DB2 is maturing rapidly," he said.

With the new releases will come performance improvements that will allow DB2 to assume a greater role in production systems. And while Wall Street seems to think that such growth will come at the expense of independent DBMS vendors such as Cullinet Software, Inc., Hessinger says it will initially come at the expense of IMS.

There are currently about 5,000 IMS users and 600 to 800 DB2 users, depending on whose estimate you accept. From July 1985 to January 1986, about 100 organizations joined the ranks of DB2 users, and 25 to 50 of them are using it as a replacement in some fashion for IMS. The majority are using it as a complement to IMS, Hessinger said.

At the moment, DB2 is either an information center or other specialized DBMS, with IMS handling the bulk of production work. As DB2 performance improves, Hessinger expects the two systems to swap places. DB2 will become more and more the workhorse, and IMS will retreat into special-purpose processing.

This is not the same as a dual data base strategy, although an element of that stopgap thinking remains. Hessinger said, "I fully believe IBM strategy is a single DBMS, and that DBMS is DB2. It is worthy of it."

The push behind DB2 does not mean that independent vendors will suddenly stop selling systems, he added. As noted above, DB2 is not now a good choice for smaller shops or mid-range users. Nor is it a good choice for those who need development tools and integrated applications right now.

The independents have highly competitive products in these areas, and it will be at least two to three years before IBM will be able to confront that competition.

But IBM is bent on converting 80% of its IMS user base to DB2 by 1990, Hessinger said. If it succeeds, DB2 will be the standard at large IBM sites and a potent engine waiting to be pushed downward.

MVS net tool enhanced

From page 19

ment program. Netview, among other things, provides support to IBM's Token-Ring network. ACF/VTAM is available now at a monthly charge of $1,710 to $2,085.

Also unveiled was ACF/Network Control Program Version 4 Release 2 for IBM 3725 and 3720 comunications controllers for MVS and MVS/XA customers. It is available at a monthly charge of $695.

Also announced was Version 3 Release 2 of ACF/System Support Program for 3705, 3720 and 3725 communications controllers. It carries a $535 monthly fee.

The immediate availability of Release 3 of the Network Routing Facility for a monthly fee of $1,175 was also announced.

MVS test tool out

By Eddy Goldberg

SUNNYVALE, Calif. — Boole & Babbage, Inc. has announced XPF/Assembler, which it says is the first full-screen test and debugging tool for assembly language programmers working in IBM's MVS and MVS/XA environments.

The product competes with TSO Test, a utility provided by IBM to help debug assembly language programs.

James Turner, Boole & Babbage senior software engineer, said XPF/Assembler's full-screen display improves on TSO Test, which displays a few lines at a time.

XPF/Assembler is scrollable in either direction and allows programmers to split the screen. The product is compatible with XPF/Cobol, another Boole & Babbage test and debugging tool.

Available immediately, XPF/Assembler costs $20,000 as a stand-alone product or $7,000 as an upgrade to XPF/Cobol.

MICROCOMPUTERS

MICROBITS
David Bright

Voice-activated writer's block

At this very moment, scientists in both business and academia are racing to produce the ultimate user-friendly machine: a voice-activated typewriter. It's going to be wonderful — instead of bothering with a keyboard, or even a mouse, we'll be able to both run a computer and create complex documents simply by speaking in a natural voice.

From a historical point of view, the invention of such a machine may rank right up there beside ENIAC (the first electronic computer), the telephone and the phonograph. For a few years now, some vendors have been claiming that the first voice-activated typewriter is just around the corner — always six or nine months away.

But despite their ambitious efforts, the current state of the technology indicates that we won't see anything close to a voice-activated system usable in a real office this decade or perhaps even this century. It's time for these vendors to stop misleading us.

A leader in this race to grab a place in history is Kurzweil Applied Intelligence, Inc. Its founder, Raymond Kurzweil, has an impressive track record. So far, he has developed one machine that reads text to the blind and another that is perhaps the most advanced music synthesizer in the world.

In addition to making office automation more efficient, Kurzweil's proposed machine would also enable deaf people to read spoken communications from other people.

See **VOICE** page 28

Bright is a Computerworld senior writer.

Nestor software translates handwriting to ASCII code

By David Bright

PROVIDENCE, R.I. — By the fourth quarter of this year, Nestor, Inc. plans to begin marketing its first product: a software package that reportedly converts any type of handwriting into ASCII characters.

The system, as yet unnamed, is based on brain model research conducted over the past ten years by two Brown University physics professors.

Intended for vertical markets that use a lot of forms, such as the insurance industry, the software requires an IBM Personal Computer AT and a digitizing tablet.

A special pen connects to the tablet, and the tablet, in turn, connects to the computer's RS-232 port.

Nestor's technical support manager David Ward stressed that Nestor's product is not meant to be a replacement for the keyboard.

However, in situations where a form is filled out by hand and then manually entered into a computer, the latter step can be eliminated, he said.

The software also allows corrections to be made by hand.

An adaptive system

According to Nestor officials, the software system is adaptive, while other products that digitize handwriting, such as those from Pencept, Inc., are not.

"The learning system comes to know the handwriting of its users like a personal secretary," Leon Cooper claimed.

Cooper, a 1972 Nobel Prize laureate for his work in superconductivity, conceived

See **NESTOR** page 26

IBM ups speed of graphics PCs

By Douglas Barney

IBM earlier this month announced versions of its 3270 Personal Computer AT/G and 3270 AT/GX, which offer increased speed and larger hard disk capacity.

Both products, which are 3270 PC ATs designed for graphics-intensive work, will be available next month, and each costs $7,510.

"These machines now run at 8 MHz, rather than at 6 MHz," said Cary Ziter, an IBM spokeswoman.

Graphics boost

The performance increase will boost the machines' ability to create, display and manipulate graphics, Ziter said. Available colors and resolution, however, are unchanged from the earlier versions.

"They still work on the same display units as we had with the earlier AT/Gs

See **IBM** page 26

NEW THIS WEEK

- West End Film releases CA-D2ART conversion package for IBM PC and compatibles
- Norton-Lambert offers remote communications system for PCs

For more on these and other new products, see pp. 75-79.

INSTANT ANALYSIS

"The leap from 80286 to 80386 technology is going to be about as significant as was the jump from CP/M to MS-DOS."

— Michael K. Crosno, vice-president of marketing, Computer Associates, Inc., Micro Products Division

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Announcing Version 5

Nestor tool translates

From page 23

the idea for the system with Charles Elbaum. "It learns from experience, working much as a child would learn to read," Cooper said. "We think it mimics certain brain-like functions."

The first user of the Nestor system is expected to be l'Union des Assurances de Paris, a large insurance agency in France, where agents will use the system to enter handwritten forms directly into the computers.

Initially, Nestor will sell the system directly to end users. Later in the year, it should be available on a retail basis, Ward said. Pricing has not yet been determined.

The software of the system has two parts, Ward explained: a kernel comprising the basic instructions and a memory segment that stores the learned information.

Because of the software's ability to adapt to varied input, it could be used to build voice recognition systems, Ward added.

The system reportedly has been trained to recognize thousands of complex Japanese Kanji characters.

Nestor also has under development an optical character recognition system that uses a video camera to read handwritten checks.

IBM speeds graphics PCs

From page 23

and AT/GXs," Ziter said.

The 3270 AT/G and 3270 AT/GX originally came with the choice of a 10M-byte or 20M-byte hard disk drive.

Users reportedly can choose between the 20M-byte or 30M-byte hard disk drive, according to Ziter.

Users contacted by *Computerworld* debated the merits of IBM 3270 PCs and ATs vs. personal computers that use 3270 terminal emulation and are equipped with products such as Digital Communications Associates, Inc.'s Irma boards.

User likes emulation

"Emulation is as good as the 3270 itself," said Lonny Bass, MIS director for Kershaw Manufacturing Co., which uses Irma-equipped PCs.

But Sue Nara, senior micro analyst with Uniroyal, Inc.'s Tire Division, argued that IBM 3270 PCs and 3270 PC ATs are preferable. "The interaction with the host on any 3270 is far superior to an Irma card," Nara said.

Although Uniroyal has a number of IBM 3270 PCs and 3270 PC ATs, the firm has not opted for the 3270 PC AT/G or GXs. "We didn't need the intensive graphics," she said.

> ***'You can use IBM AT/G and AT/GX as graphics displays, stand-alone graphics workstations or personal computers.'***
>
> — Cary Ziter, IBM

Ziter stressed the versatility of the 3270 PC AT/G and GXs when equipped with various options. "You can use IBM AT/G and AT/GX as graphics displays, stand-alone graphics workstations or personal computers," Ziter said.

Available as options

IBM also announced that the 3270 PC AT/G and AT/GX graphics displays are available as options for the IBM PC AT 5170 (the standard IBM AT) for $770.

This allows users of standard IBM ATs to attach IBM 5279 color displays, IBM 5379 color or monochrome displays, the 5277 mouse or 5083 Model 2 tablet.

The machines will be sold by IBM value-added dealers and IBM marketing divisions.

The systems are said to be compatible with existing version of the IBM 3270 PC ATs.

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Voice-activated writer's block

From page 23

Now Kurzweil claims that by year's end it will have available a $30,000 system capable of recognizing as many as 10,000 words. However, a similar machine was expected from Kurzweil last year — and the year before. But Kurzweil should not be faulted for its efforts, only for its unrealistic claims.

Researchers at MIT are much more modest. For commercial benefit, the current voice recognition technology is "limited, fragile and not readily extendable to more complex tasks," according to Professor Victor Zue.

The MIT project centers around the interpretation of voice waves printed out on a spectrogram. So far, researchers trained in spectrogram reading have been able to transcribe unknown sentences with an accuracy rate of 85%.

Trick is to improve accuracy

The trick will be to greatly improve the accuracy rate and transfer the learned techniques to an expert system. Zue maintains that it will be many years before a successful voice recognition system is developed by MIT or anybody else.

It's good to see that Votan, a leader in the fledgling voice recognition market, is looking at things realistically.

"The technology is just not there for the voice-activated typewriter," says Bob Russo, vice-president of sales and marketing. Although Votan has its own voice-activated typewriter project in progress, Russo stresses that in the near future, voice products will be best suited to more specific, limited applications. So far, the most popular voice recognition applications are telephony (credit card validation, for example) and factory data entry.

Influx of voice products predicted

Russo predicts that the next 14 to 15 months will bring a major influx of voice products into the office automation market. These will include telephony products, but many will be voice store-and-forward-related (not really voice recognition) products such as voice messaging and annotation.

Russo says increased — although limited — use of voice recognition products in the office is a definite possibility. According to a Votan survey, 87% of office workers require only 45 words or less to run their typical applications.

Since Votan's add-in boards for the IBM Personal Computer can recognize about 150 words at a time, they are well suited for applications such as Lotus Development Corp.'s 1-2-3, Russo notes.

But he adds that voice recognition is not really going to catch on in the office until minicomputer and microcomputer vendors integrate voice as an option with their products.

While the systems vendors haven't yet heavily pushed any voice options, some are involved in the quest for a voice-activated typewriter. Possibly as a response to Kurzweil's recent high visibility, IBM for the past year or so has been publicizing its own voice recognition efforts.

Not to be outdone by the brash young Kurzweil (which is partially financed by two competitors — Wang Laboratories, Inc. and Xerox Corp.), IBM claims its experimental system is the most advanced voice recognition system in the world.

Developed at the Thomas J. Watson Research Center in Yorktown Heights, N.Y., IBM's experimental desktop system reportedly transcribes sentences from a 5,000-word vocabulary with an accuracy rate exceeding 95%.

> ***So far, researchers trained in spectrogram reading have been able to transcribe unknown sentences with an accuracy rate of 85%.***

Although the system is based on an IBM Personal Computer AT, it contains six custom-built, digital-signal processing boards representing probably $1 million worth of mainframe computing power.

Keep in mind that this is strictly research — IBM currently has no plans to commercially market such a system. While a demonstration of the experimental system at last month's 1986 National Computer Conference was impressive, it was easy to see why a true voice-activated typewriter remains far in the future.

The demonstration was conducted by a man ensconced in a glass booth who was speaking slowly in a monotone with short pauses between words.

An idea of how far the technology has come — and how far it has yet to go — can be heard by calling market leader Votan's voice recognition demonstration number.

For example, a mock airline reservation system asks whether you want to go to New York or San Francisco. If you answer correctly, the system responds with remarkable speed and accuracy, but if you say New Jersey or Chicago instead of New York, you are likely to get booked on the next flight to San Francisco.

Let's hope the "voice-activated typewriter" vendors aren't sending us in the wrong direction.

COMMUNICATIONS

DATA STREAM
Dan Minoli

Analyze your network dollar

The following observation was true when it was made by a major communications authority a few years ago and is even more applicable now: "A great deal has been published on the scientific and technical aspects of telecommunications — very little on the engineering economics of the subject. The development of a [data communications network] is continuous, and long-term planning extending far into the future is essential; always the best use must be made of presently available capital and always in complex relationship with operating and maintenance costs, interest, depreciation and revenue."

Financial sanity is especially important during the development and implementation of private satellite-based or optical-fiber networks, which, unlike carrier-based services, require major up-front monetary outlays by the customer.

Carrier services can always be discontinued; expensive feasibility studies and expenditures for hardware usually cannot be recovered. Another advantage to using a network service is that you can usually rely on the carrier to have performed major economic studies to ensure resource efficiency and to be tracking technology in order to employ the latest and the best.

In contrast, a business installing its own network must pay for its own eco-

See **ANALYZE** page 31

Minoli is a lecturer with New York University's Information Technology Institute as well as a full-time data communications researcher and strategic planner.

Bell packet networks stalled

Potential competitors want equal access, costs

By Elisabeth Horwitt

A recent rash of packet-switching tariff filings by the divested Bell operating companies have run up against objections from vendors who are concerned that the new offerings will compete unfairly with their own network services.

According to product manager Michael Delaney, network vendors' intervention could delay Southwestern Bell Telephone Co.'s recently filed packet-switching tariff for as long as six months.

"I have not opposed the divested Bell operating companies getting into packet switching," Telenet Communications Corp. President David Hann told *Computerworld* earlier this year. "What Telenet has spoken out against is the subsidization approach." In order to win approval for packet-switching tariffs that include enhanced services such as protocol conversion, divested local carriers must submit plans to the Federal Communications Commission describing how they will keep separate their regulated and deregulated communications services.

Network vendors like Telenet review these plans to ensure that the new services will not receive subsidization or preferential treatment from the local telephone monopolies. "All we're asking is that they offer us the same access at the same basic costs that they pay for their own lines. Let them compete with us head-on," Hann said.

Packet-switching vendors' objections are at least partly to blame for delayed FCC approval of Nynex Corp.'s Infopath packet-switching service, announced in April. Telenet filed with the FCC its reservations about Nynex's ability to make good on its guarantee of equal access, according to Director of Regulatory Affairs Michael Hirsch. "The problem is that Nynex customers are being offered data-over-voice links to the packet-switching

See **BELL** page 33

U.S. Sprint cuts rates up to 48% to compete with AT&T, MCI

By Elisabeth Horwitt

SHAWNEE MISSION, Kan. — The first tariff filing by the recently formed U.S. Sprint Communications Co. will result in rate cuts of up to 48%, the company announced recently. The reductions, which will take effect on Aug. 1, are part of the company's strategy to maintain lower prices than its two primary competitors, AT&T and MCI Communications Corp., said U.S. Sprint Senior Vice-President of Sales and Marketing, Edward Carter.

The cuts will reportedly save U.S. Sprint customers up to 35%, compared with what they would spend with AT&T. The new WATS rates are up to 17% lower than AT&T's rates, and volume discounts

See **U.S.** page 30

PC, Unix united via Ethernet

By Stanley Gibson

MILPITAS, Calif. — Lanscape, an IBM Personal Computer Ethernet system recently introduced by Univation, Inc. enables IBM Personal Computers and Unix systems to communicate over an Ethernet local-area network (LAN), the company claimed. A network server also provides a gateway to the IBM Token-Ring network.

"We are connecting the Unix and PC worlds," said Inder Singh, an independent consultant who helped develop Lanscape.

The Lanscape family includes network boards, a server and several network software packages. The NC 516 Network Interface Card interfaces IBM PCs, Personal Computer XTs or ATs and compatibles to an IEEE 802.3-compatible LAN. The Intel Corp. 80286-based FS 2000 series file serv-

See **PC** page 30

NEW THIS WEEK

- Racal-Vadic announces a 1200VP asynchronous modem
- Telenetics Corp. unveils its MNP modem error control module

For more on these and other new products, see pp. 75-79.

INSTANT ANALYSIS

"We feel that the FCC has drawn an artificial distinction between 'basic' packet switching and 'enhanced' offerings such as protocol conversion. Protocol conversion is an intrinsic part of packet-switching services, which are used by the public to enable disparate systems to talk to the same host."

— Michael Hirsch, director, regulatory affairs, Telenet Communications Corp.

PC, Unix united

From page 29

er supports up to 100 workstations on Ethernet or the IBM Token-Ring.

"We feel that LANs will continue to develop along both Ethernet and Token-Ring lines. And no matter which one becomes dominant, Lanscape will be able to integrate both," Andy Khanna, Univation president said, explaining his company's marketing strategy.

Lanscape network operating system software includes versions of Novell's Advanced Netware 2.0 operating system for either the FS 2000 or for an IBM PC or AT-based server.

Univation is currently working on a version of Netware that will be "more user-friendly and provide better application integration," Singh said.

IBM PCs and ATs running Univation's Unix Transmission Control Protocol/Internet Protocol (TCP/IP) can communicate on the network with Unix systems that are also using the TCP/IP. Ethernet boards for the Unix systems must be obtained from other vendors, Singh said. IBM PCs can exchange files with a Unix system or communicate in terminal-to-host mode.

The current version of Lanscape does not enable Unix systems to initiate file transfers with PCs, Singh said. "The Unix system functions basically as a server."

Personal Computers equipped with Univation's Netbios Emulator can run applications software written for IBM PC Network's Netbios communications software. Univation also provides an electronic mail system for use with Lanscape.

Dick Tobey, Univation's senior vice-president in charge of engineering, said that Lanscape gains speed from its "flexible multiple packet" buffering scheme that allows its node cards to receive up to 32 packets in rapid succession without intervention from the CPU. This speeds up the network by eliminating the retransmission of lost packets, Tobey said.

The buffer can also hold up to 10 maximum-length packets, which enables requests to a node to be received and executed in order, rather than the requests having to go around through the network again if the node is busy, Tobey added.

A five-user system including file server and software costs $12,260, with the cost per user decreasing as the number of users increases. A 24-user system costs $21,665. A five-user system without a file server is $4,665.

U.S. Sprint cuts rates

From page 29

are 50% greater than MCI's volume discounts, U.S. Sprint claimed.

"MCI and U.S. Sprint are trying to stay 15% under AT&T in order to hold on to their market share, but I don't see how they can keep on cutting their rates like this," said Daniel Rosenbaum, of the Morristown, N.J., consulting company Winston/Smith Associates.

He pointed out that now that other communications carriers are being given equal access to local telephone company central offices, they will no longer receive a 55% price break on access charges.

The advent of equal access has been "a gradual thing that we've been dealing with for some time," U.S. Sprint spokesman Syd Courson said. He added that the cuts have been possible because GTE Sprint and U.S. Telecom, the two partners in the recent merger, "don't do a lot of leasing of other carriers' lines."

"We don't figure on losing any money on the current cuts, because they will help us fill our current network capacity with new customers. And when our optical-fiber network is fully installed over the next two years, we'll get off AT&T lines completely," Courson said.

In the near term, the optical-fiber network will cost the company approximately $2 billion, Courson said. But he added that U.S. Sprint will realize savings, since optical fiber "is much more cost-efficient than either copper-based or microwave links."

Analyze your network costs

From page 29

nomic modeling and risk analysis. But this should not deter the network manager from undertaking these tasks.

In fact, when a company is buying its own network equipment, it is especially crucial to weigh the risks and advantages of new technologies, since a miscalculation will cost the company hard dollars.

This column discusses some basic decision support tools and principles that can aid data communications planners and practitioners in effectively evaluating alternatives during the private network planning process.

To help the practitioner make sound decisions, a collection of disciplines generally referred to as decision theory or engineering economy has evolved. Decision theory draws on the following areas:

- Financial analysis (including forecasting).
- Probability and statistical analysis.
- Risk analysis.
- Optimization theory (linear programming in particular).
- Game theory (decision analysis when there are conflicting goals — departments competing for funding, or a customer negotiating with a vendor for better service, for example).

The above are very powerful data communications resource management tools. Although decision models have been available for several decades, they have been used primarily by common carriers and other sophisticated network users.

While the total monetary value of network installations remained small and the useful life of the equipment was long, the general user community had less need of decision modeling.

Today, however, with communications equipment budgets growing, system life cycles are shortening and fewer and fewer businesses can afford to make crucial buying decisions without performing preliminary analysis.

Based on economic realities

Communications-related decisions should not be based on the elegance and novelty of the latest technological breakthroughs, but on economic realities after contrasting all available options, including mature technologies.

Several of the following points are evident soon after one starts a serious analysis process:

- A practitioner should not subscribe to a technology or solution based on the amount of media coverage it has been given. Old technologies like multiplexing and circuit switching are still very useful and cost-effective.
- A risk analysis that takes into account the random nature of the business environment is always a good idea, but rarely done.

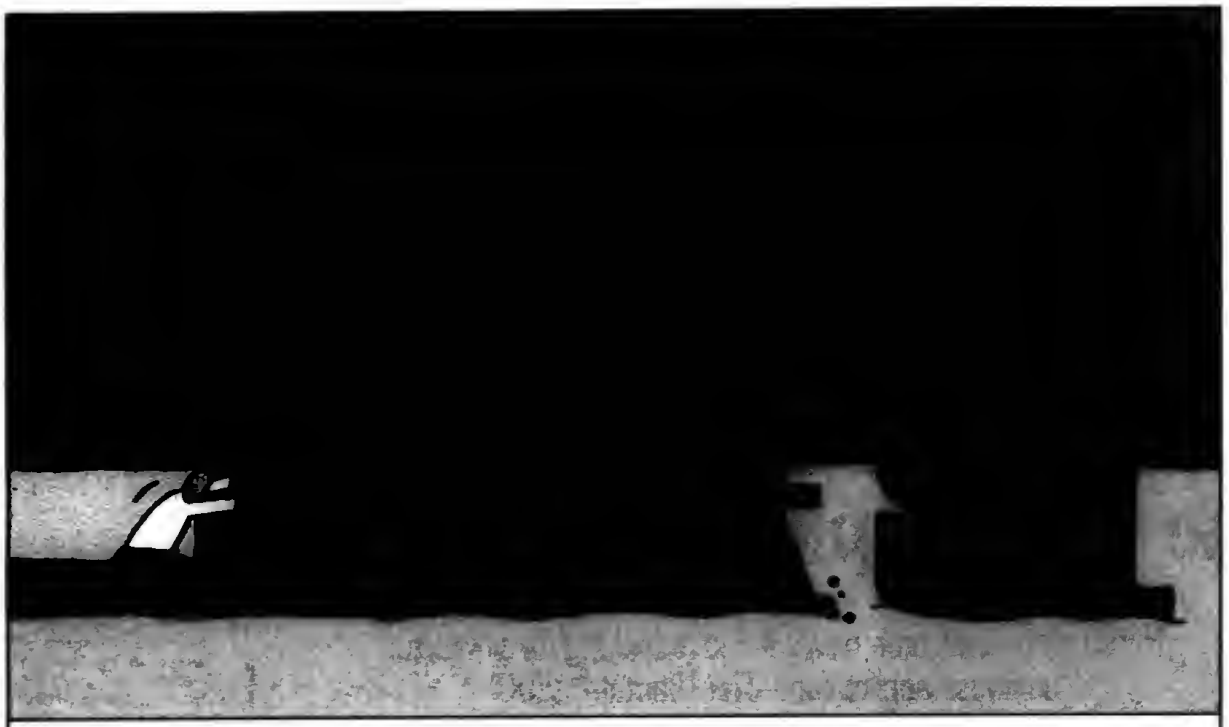
As a result, most companies' solutions are "probabilistically optimal," "optimize the expected value" or represent the "maximum likelihood."

This means that, given a specific case, even a solution that is optimal will lead to an undesirable result.

- When analyzing a problem, the manager must explicitly take into account *all* cost and risk factors, not just the most ostensible or convenient.
- The solution to any given problem depends on how a company prioritizes its objectives. Some of the possible goals are to minimize cost, maximize the cost-benefit ratio (getting the most network for the buck), maximize corporate strategy (build a network that makes the company more competitive; enable it to enter new markets), maximize security, maximize reliability, maximize quality of service, maximize growth opportunities and maximize prestige of the firm (buy state-of-the-art equipment in order to impress investors, competitors, public, boss and so on).

Clearly, not all of these criteria are compatible with one another. A network built to minimize cost will most likely not maximize reliability and quality of service, for instance.

At the risk of stating the obvious — the network manager needs to have a clear idea of his company's communications needs, before he can determine which network solution will best serve them.



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RELATIONAL DATABASE SYSTEMS, INC.

Bell packet networks stalled

From page 29

service," Hirsch explains. "They promise to provide us with the same type of link at comparable costs, but we don't see how that's possible, since they have many more central offices than we have nodes in their region, and are likely to be much closer to a customer's site."

U.S. West is the only regional holding company that has not yet filed a packet-switching tariff offering with the FCC. Tariffs proposed by divested operating companies within Nynex, Southwestern Bell Corp. and Pacific Telesis Group still await FCC approval. Divested operating companies within Bell Atlantic Corp., Ameritech and Bell South Corp. and independent telephone company Southern New England Telephone Co. currently offer packet-switching services.

In its comments on several filings, Telenet has accused divested Bell companies of suggesting unrealistically low tariffs for packet-switching services. "Rates have to be based on future demand, which we think they're overestimating," Hirsch says. President Hann painted a scenario in which local carriers would first undersell their competitors, then subsidize the resulting net loss with profits from their telephone subsidiaries.

The FCC has responded to the vendors by having AT&T and Bell Atlantic report the volume of use of their packet-switching services. Bell Atlantic's tariff only went into effect in June, so no numbers are available yet. AT&T's figures are reportedly lower than its projections.

Amy Francis, a senior analyst at Boston-based consulting firm The Yankee Group, is pessimistic about future growth of the divested companies' packet-switching customer base because "there have been no real breakthroughs in the search for intra-local access and transport areas (LATA) packet-awitching applications."

An early customer of Southern Bell Telephone and Telegraph Co.'s Pulselink, Knight-Ridder Newspapers, Inc., hoped to use the packet-switching service to support its videotex services. But the offering never got off the ground, according to Francis.

"The only real application for local packet-switching services is as a gateway to the interstate networks like Tymnet," she says.

Compuserve, Inc. has adopted the gateway concept on a grand scale, extending its own private packet-switching network with service offerings from the divested Bell operating companies and with major carriers such as ITT, RCA Corp., Tymnet, Inc., Telenet and Canadian packet-switching service Datapac International.

The data base and electronic mail service company welcomed the advent of local-carrier packet-switching services as a way to provide more local access for its customers, according to Vice-President of Network Operations William Duvall. "We have 240 packet-switching nodes in major cities, but people in remote locations are paying $5 to $18 to access our nearest node," he notes.

"Through local-carrier networks we can provide more customers with local service without having to put more nodes in ourselves. That just isn't cost-effective when you're only reaching six or seven users," Duvall adds. Compuserve already has entered a service agreement with Southern New England Telephone and New Jersey Bell and is working on similar arrangements with other regional companies.

But Compuserve is one of the few exceptions to the predominantly low demand for intra-LATA packet switching, according to Paul J. Bell, president of New York consulting firm The 23K Group, Inc.

In order to network the sites of a nationwide company, a group of regional operating companies would have to link their networks, he points out. "You'd have to go through half a dozen central-office switches to connect all your sites. With or without enhanced services, the local companies just can't compete with interstate companies like Tymnet," Bell says.

IBM opts out of cable sales

By Elisabeth Horwitt

RYE BROOK, N.Y. — Customers will no longer be able to order the IBM Cabling System for the Token-Ring network directly from IBM, the company announced recently. The cable will be available through five authorized electronics supply houses: Graybar Electric Co., Anixter Bros., Inc., Vertex Peripheral Corp., North Supply Co. and General Electric Supply Co.

"When we introduced the cabling system two years ago, we decided to sell it directly because there were not many outlets available then, and we wanted to ensure that the cable was readily available," an IBM spokeswoman said. Now that third-party distribution channels and certification facilities are established, IBM's participation is no longer needed, she claimed. In April, IBM turned over administration of the Network Cable Certification Program to ETL Testing Laboratories, Inc. of Cortland, N.Y.

Customers can find out the name of the nearest authorized cable outlet from their IBM customer representatives, who will continue to market the cabling system, IBM said.

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SYSTEMS & PERIPHERALS

HARD TALK
James Connolly

Looking for a revolution?

It may be true that familiarity breeds contempt. If so, maybe IBM can look to that old saying as an explanation for the growing criticism of the company's new models of the System/36 and System/38 and of the other products introduced last month.

If one thinks back to June 16, the day IBM introduced 125 products at the National Computer Conference, one will recall that the reaction from users and analysts was almost all positive. The three System/36 models, six System/38s, disk drives and communication products were praised for their promised performance and lauded as steps in the right direction.

A little more than a month has passed since the announcements were made, and it is interesting to see how the comments — particularly those of analysts — have changed.

One analyst recently opined that IBM's introductions merely added to the confusion surrounding the company's mid-range line, rather than clarifying its strategy.

Others point to the System/36 and proclaim that it is still underpowered when compared with minicomputers such as the Digital Equipment Corp. Microvax II.

Another observer writes that the new System/38 models are just "old wine in new bottles."

Contrast those comments with one of the first-day analyses that said the introductions indicate "an aggressive

See **LOOKING** page 37

Connolly is Computerworld's senior editor, systems & peripherals.

Burroughs fills power gap; A 5 bolsters low-end line

By James Connolly

DETROIT — Attempting to fill what company officials considered a performance gap, Burroughs Corp. last week added a third system to the low end of its A series of mainframes.

The A 5 reportedly offers more than twice the power of the nearly 2-year-old A 3 system, which can be upgraded to the new A 5.

"We are stressing the fact that you can upgrade from the A 2 to the A 3 and to the A 5 within the same cabinet," said Bill Petti, Burroughs's program manager for the A 3 and future products. The A 2 was introduced in March.

Fred A. Meier, vice-president of Burroughs's Corporate Program Management, added, "The A 5 is an attractive option for customers who want more processing power than is available from the A 3, but who don't require a large mainframe."

Petti noted that the A 5 is intended in part as a competitive answer to IBM's February announcement of models for its 4381 line of small mainframes.

Many similar features

He reported that the cabinet, memory and basic processor are the same for the A 2, A 3 and A 5, but that the A 5's processor is enhanced to provide more power.

The single-processor A 3F can be upgraded to the A 5F for $98,500 through replacement of six boards and power supplies.

Dual-processor A 3Ks cannot be upgraded, although Petti said more announcements are expected to ease any concerns on the part of A 3K users.

Petti said that Burroughs, which does not provide performance ratings based on millions of instructions per second (MIPS), rated the A 5 2.23 times more powerful than the A 3.

See **BURROUGHS** page 36

HARDWARE NOTES

Optical storage displays show-stealers

It was noticeable at the 1985 National Computer Conference, and it stood out again at NCC '86 last month. Some of the most popular exhibits on show floors continue to be the **optical storage displays**, even at a thinly attended show such as this year's NCC. It appears that even if DP managers are not looking to buy optical storage for general-purpose use, they are interested in it for narrow applications or as a technology that is worth following.

■

One traditional magnetic storage media vendor that is trying out the optical market is **BASF Group AG** of West Germany, parent company of BASF Corp. BASF, which claims to be Europe's leading manufacturer and supplier of magnetic storage media for audio, video and DP applications, reports it is bypassing first-generation, write-once disks. Instead, the company says it will concentrate on media-based organic layers of dye for once-recordable disks, and on magneto-optic layered disks for repeatedly recordable disks. BASF officials claim that optical storage technology is more likely to replace filing systems based on paper and microfilm than magnetic media. BASF's goal is to have samples available in 1987.

■

Shipments of **Burroughs Corp.**'s V 310 mainframe began a little earlier than

See **NOTES** page 36

NEW THIS WEEK

- Emulex Corp. introduces its MD23 and MD24 disk controllers
- Roland DG releases a CAMM-3 three-dimensional plotter

For more on these and other new products, see pp. 75-79.

INSTANT ANALYSIS

"Within five years, the departmental computer, which is going to be a 32-bit minicomputer, . . . is going to have very few terminals attached to it. Rather, it will be a PC servant."

— George Colony, president of Forrester Research, Inc.

DATA VIEW

Top 10 general-purpose computer systems: IBM holds first five positions
Based on the dollar value of existing U.S. installations

Manufacturer and System	Rank	Installed Systems	Typical Price (dollars in thousands)	Total Purchase Price (dollars in millions)
[illegible]	1	[illegible]	[illegible]	[illegible]
IBM 3084	2	627	6,500	4,076
[illegible]	3	[illegible]	[illegible]	[illegible]
IBM 3083	4	1,729	2,000	3,458
[illegible]	5	[illegible]	[illegible]	[illegible]
Digital Equipment Corp. VAX 11/780	6	16,765	200	3,353
[illegible]	7	[illegible]	[illegible]	[illegible]
IBM System/38	8	8,956	240	2,149
[illegible]	9	[illegible]	[illegible]	[illegible]
Hewlett-Packard Co. 3000	10	13,924	100	1,392

IBM cautiously testing parallel processor waters

By Donna Raimondi

While dozens of vendors release parallel processors into the marketplace, IBM scientists are slaving away at creating a parallel processor that will not hit the market for years, if at all. What will determine its fate is whether or not Big Blue can solve the very real problems inherent in parallelization.

Begun in 1981, the Research Parallel Processing Project, known as RP3, is not connected to any product program at IBM, a project scientist says. "We won't make many, so we didn't make it cheap or small or use any novel technology in it," adds the scientist, who asked to remain anonymous, during a recent briefing on IBM's Yorktown Heights, N.Y., research projects.

"It has all standard component technology, even some obsolete technology," he says. The system is big and clumsy, but if IBM decides to redesign, it could reportedly easily reduce the machine to a fraction of its present size.

The reason IBM is so casual in presenting the RP3 project is the firm's unique position in the industry, says Francis R. Gens, vice-president of IBM services at market research firm International Data Corp. (IDC) of Framingham, Mass. "The parallel architecture has the poten-

See **IBM** page 39

Notes: DEC memory deal

From page 35

scheduled last month. The first V 310s, which carried a third-quarter delivery date when announced in March, were shipped to **John Hanson Savings and Loan, Inc.** in Washington, D.C., and to **Super Valu Stores, Inc.** of Minneapolis.

A Burroughs spokesman said the early shipments were made possible by the rapid qualification of the system.

■

Digital Equipment Corp. recently announced a program to encourage users of its VAX 8600 and VAX 8650 superminicomputers to increase their memory configurations.

The program includes price reductions on 16M-byte memory arrays, a trade-up program for 4M-byte memory arrays and free on-site service for add-on memory.

■

In another announcement, **Digital Equipment Corp.** and **The Foxboro Co.** of Foxboro, Mass., have signed an OEM agreement.

Foxboro will market industrial process and manufacturing control systems using DEC's VAX 8200, Microvax II and Micro/PDP-11 computers.

DEC also signed an agreement with **Aptec Computer Systems, Inc.** of Portland, Ore. Aptec manufactures an I/O computer that manages data flow between high-speed peripherals on DEC's VAX computers under the VMS operating system.

The pact calls for the two companies to share nonproprietary sales, marketing, technical and user information and to coordinate joint sales activities and product training seminars.

■

On the downside for **Digital Equipment Corp.**, its ranking in **Computer Intelligence Corp.**'s (CI) top 10 list of general-purpose computer systems slipped from No. 2 to No. 6 in less than a year.

DEC's sole system in the top 10, ranked on the basis of total purchase price for all installed systems, is the VAX-11/780, which has an installed base of 16,765.

CI's May figures showed **IBM** dominating the top 10 with its 3081, 3084, 4381, 3083 and 3090 systems, ranking from one to five and priced at $1 million or more by CI estimates.

Following were the VAX 11-780, the IBM System/36, with 39,947 installations, IBM's System/38 and 4341 and the Hewlett-Packard Co. HP 3000.

CI officials noted that the 3081's top position is jeopardized by the 3090's climb from its unranked and undelivered position a year ago to the No. 5 spot.

■

National Semiconductor Corp. recently said it is now producing samples of a 15-MHz version of its NS32332. The 15-MHz parts are being targeted initially at the real-time market.

Burroughs fills power gap

From page 35

Industry observers had previously rated the A 3 at about 0.7 MIPS, which would give the A 5 a rating of about 1.6 MIPS and make it comparable with the IBM 4381 Model 11.

The A 5 features a memory range of 6M bytes to 24M bytes and supports up to 10G bytes of disk storage. The base memory can be expanded in 3M-byte increments, using 256M-bit chips, at a cost of $6,000 per 1M byte.

The system runs Burroughs' MCP/AS operating system, which was introduced as an option for the A 3 in October.

An A 5 will run software based on the most recent versions of Burroughs' earlier MCP operating system without recompilation, according to Petti. The A 5 costs $224,000 and will be available in September.

Looking for a revolution

From page 35

new IBM is now on the street."

So the question to be addressed is whether the new IBM products are actual gains or just the same old same-old. The question cannot be answered until the new machines are delivered and move into production at user sites, with the first sites likely to be those in which customers are most desperate for more power.

One should remember that judgment day is still between a month and several months away for most of the products. It may sound as if some IBM critics can never be appeased; it is more likely that those critics are making the mistake of looking for a revolution in a world that grows through evolution.

There seems little doubt that the System/36 has inadequacies, particularly in terms of raw power. Any quick survey of randomly selected users — whether they are office automation or general business users — illustrates that. The June 16 announcements are unlikely to overcome all of those complaints. All the user can hope for is some solid progress.

However, it should be remembered that in an evolutionary process, breakthroughs are few, and that much of the history of the computer industry — not just the IBM mid-range line's history — has been an evolution. Only in retrospect do events such as the growth of the personal computer market seem revolutionary. Developments such as that one required the better part of a decade filled with false starts and false promises before solidifying.

When was the last revolutionary development in the mainframe market? It may have been the introduction of the IBM 360 more than 20 years ago. It certainly was not the IBM 3090 or IBM's MVS/XA, both of which are fighting for market share.

Even the Microvax, with which the System/36 is so often compared, may not qualify as revolutionary. That DEC system is three years old and is still subject to user complaints and promises of new and improved versions.

What managers have to keep in mind is that for all of the speculation and vendor promises about revolutionary systems, those so-called revolutions actually evolve over the course of years, and that most products in all areas of the computer industry will continue on their comparatively slow and sometimes troubled courses.

The best the manager can hope for is to gain a little bit here and a little there and to make the most of what he can get today.

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IBM tests the waters

From page 35

tial of negative impact on IBM's established hold on the industry," he says.

When IBM talks about systems in development, it is a sure sign that the project is not close to maturity, says Jeffry Canin, supercomputer analyst at the Hambrecht & Quist investment firm in San Francisco. "Parallel processing is still in its very early stages. It will be a major breakthrough in the '90s, not in the '80s," he says.

IBM talks about the project because it does not want to be viewed as being in technological backwaters or as holding back progress in the industry, Gens says. But Big Blue probably will not release a strictly parallel system for at least four or five years, he adds.

Not until other parallel vendors pose a serious competitive threat or until IBM can figure out a way to gain great profit margins with parallelism, will IBM introduce such a system, Gens says.

Canin says the threat would have to come from somebody like Digital Equipment Corp. or the Japanese vendors. "There are viable entries in the parallel field today, but most machines are in pure research environments."

Impressive power

The projected RP3's power is impressive by today's standards. The 512-node system (each node has a reduced instruction set processor with floating-point unit) is expected to have 2G bytes of main memory and a peak performance figure of 1,300 million instructions per second (MIPS).

Sustained performance will be 1,000 MIPS or 800 million floating-point operations per second (Mflops). The I/O rate should be 192M byte/sec. with an interconnection network operating at 13G byte/sec.

As it stands now, the system "is one-eighth of a 512-processor system, not a 64-processor machine," IBM says. The vendor expects to demonstrate the present configuration's functionality in the first half of 1987.

The RP3's operating system is AT&T Unix-based, so "anyone able to use Unix will be right at home," IBM says. Memory will be globally or locally shared, or both, at the discretion of the system's programmers.

RP3 is one of the projects under way at the Thomas J. Watson Research Center in Yorktown Heights, where about 8% of IBM's staggering $3.5 billion research and development budget is spent. IBM participates in several university and government laboratory parallelization software and hardware studies — most importantly with New York University's Courant Institute of Mathematical Sciences — in order to get all the help it can in creating this machine, the IBM scientist says. The company foresees a future for the RP3 in applications as diverse as artificial intelligence, design automation, scientific computation, simulation, graphics, image processing, expert systems and data base.

"IBM's most powerful traditional systems, like the 3090, could continue to be developed for the applications that parallel systems can do," Gens says. "They are serial processors, but a lot of those applications lend themselves to parallelism."

But there are major problems that must be worked out first — problems that IBM says any large parallel system's networking scheme will experience as the number of processors grows into the hundreds.

RP3 researchers found "hot spots" — memory locations to which all the data paths in the network were more likely to go for data — that caused data buffers to jam "like a backed-up sewer system," the scientist says. "We found that if you deviate even one-eighth from uniform distribution of data flow, you lose one-half of your bandwidth time."

The scientist maintains that all switching methods have this problem, "regardless of whether you use shared memory or message passing." A single hot spot can wipe out the whole system, he says, or to put it another way, one user can "mess up the system for everybody else."

The combining solution

IBM has discovered that "combining" can deal with the problem, but it slows down the processing considerably. Combining is a process said to look at messages being passed through the switch. If there is a duplicate message, combining sends just one of those messages along. It will then look at returning messages and make as many duplicates of the response as needed. "Doing this makes the net cost of the system from six to 24 times higher — that is a real problem," the IBM scientist says.

There are other problems with parallel architecture that are more severe than memory contention, IDC's Gens says. Application development tools and programmer retraining are serious issues. "It is unlikely that the optimal language to write a parallel application in is Fortran — very unlikely."

"What we will find out with this machine is whether you actually can get parallelism — it might be a huge success," the IBM scientist says. But so far, the research team has a mandate to build only the one-eighth unit. After that, nobody knows whether the 512-node unit will be built. "It is research, not a product," IBM says.

In the meantime, the company has used the RP3 project to learn more about parallelism. It uses proprietary parallel systems internally to design processors, and the RP3 project people have discovered a way to run parallel code on the IBM 370, which IBM says has always been a parallel system although it is not generally used that way.

"We have done 19 real applications, mostly with hundreds of lines of code, and some thousands of lines of code with hundreds of subroutines," the scientist says.

Gens points out that IBM's parallel push is in two directions. "One is a concentrated focused effort on the RP3 parallel processor. The other is parallel exteosions to current products. This RP3 is just one of IBM's efforts in parallelism."

What we learned about Houdini, Einstein and

These aren't your average, everyday R&D resources we agree. But as history tells us, the answers to some of the most complex problems can be found in some surprisingly unusual places.

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Executive Report

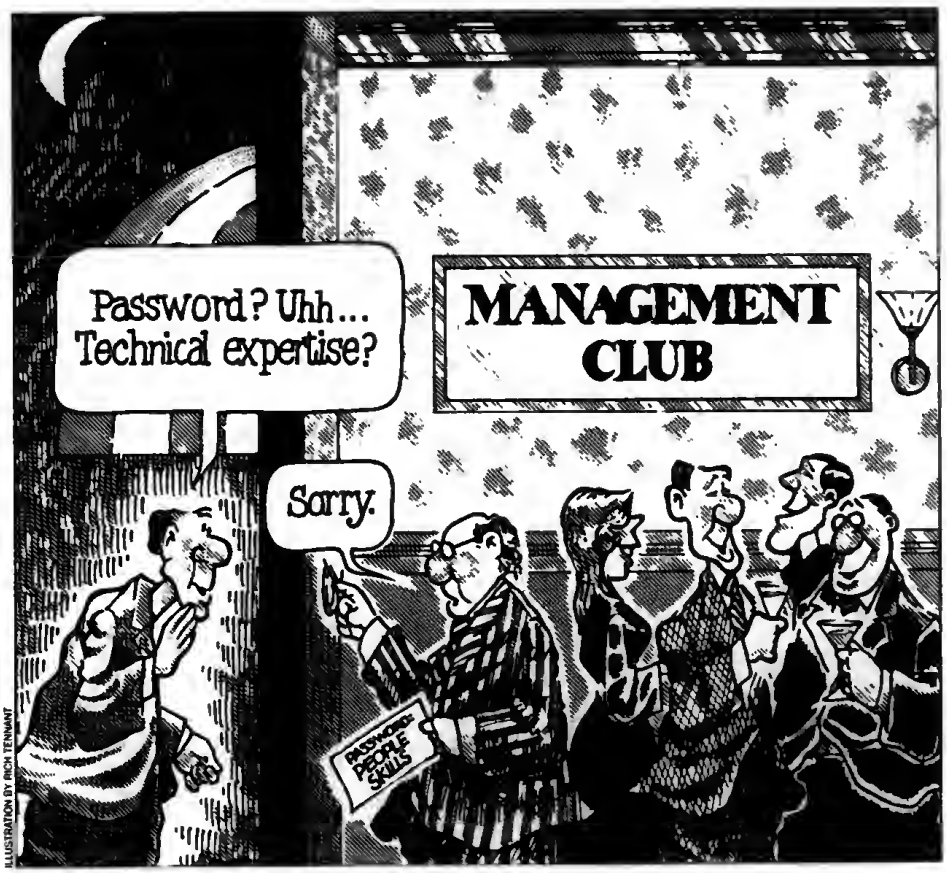

ILLUSTRATION BY RICH TENNANT

INSIDE

Training for MIS

You can turn a technician into a manager

By GLENN RIFKIN

At Manufacturers Hanover Trust Co. in New York, selected systems people may spend up to 13 weeks at Harvard University, Stanford University or other prestigious business schools learning management skills.

At Pepsico, Inc. in Purchase, N.Y., the MIS department sends senior analysts and project managers to extensive management training courses involving 25 to 30 other corporations in which issues such as "managing technical people" are examined in a roundtable setting.

Aetna Life & Casualty Co. in Hartford, Conn., long ago instituted an intensive in-house program for systems people who study a full curriculum of management training courses for up to 10 weeks.

IBM, which spends nearly $1 billion annually on internal training for its employees, offers multifaceted programs for teaching technical people management skills. New and veteran managers are required to take a minimum of 40 hours per year of management training and refresher courses. This type of training is, says an IBM spokesman, fundamental to IBM's philosophy.

No, these Fortune 500 companies are not attempting to change the unchangeable. It is, contrary to popular belief, possible to train technical people to be managers.

As end-user computing pervades the offices of corporate America and as information systems become a pipeline to strategic advantage, the need for more and better MIS managers is clear.

What is not clear, however, is how to find or perhaps create this new breed of manager. Courses, seminars, training programs and best-selling books aside, it is no easy task to change the spots on the technical leopard, as MIS executives and consultants attest.

As MIS becomes a pipeline to strategic advantage, the need for more and better MIS managers is clear. What is not clear is how to find or perhaps create this new breed of manager.

DP/MIS people continue, whether fairly or unfairly, to earn the reputation for being too oriented to technology to manage people; the very qualities that make them good at their jobs supposedly make them bad managers. The assumption is that these highly intelligent, highly analytical, lone-wolf types speak in acronyms, cannot communicate their ideas to corporate users and are more difficult to train as managers than others in the corporate environment.

"Managing is leveraging the knowledge you have and others have, and it takes technical

Continued on page 45

Rifkin is a Computerworld *senior editor.*

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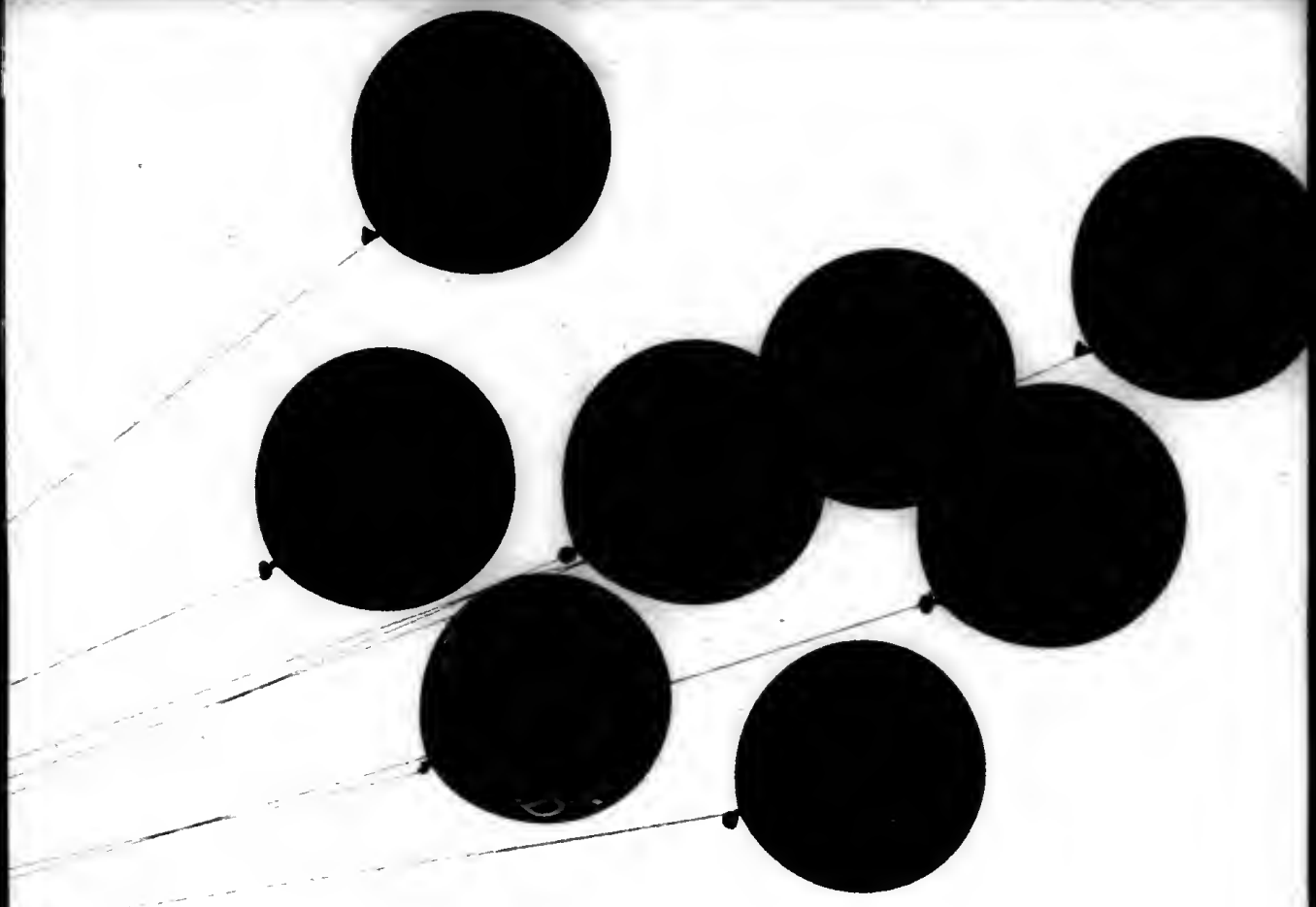

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NETWORKING

Good technicians may become bad managers without special attention

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people a while to learn how to do that," according to Mel Bergstein, managing director of technical practices for Arthur Andersen & Co. in Chicago.

"Systems people are criticized for being too careful, but for 20 years they were taught to be careful," adds Walter Popper, a principle at Index Systems, Inc., a Cambridge, Mass., consulting firm. "They had one set of expectations — which were once appropriate, but they may not be appropriate today."

Managing itself is simply antithetical to what may be the inbred qualities of a top-notch technician. According to Bonnie Johnson, director of corporate technical planning at Aetna, systems people have traditionally been rewarded for making the equipment work, often a task of analysis and thought done best alone. "Management is getting a commitment to ideas, making requests heard as requirements. Systems people don't often think in terms of 'Who needs to be involved in this decision, and how can I couch this message to persuade them that it is necessary?' "

Thomas Quick, executive director of Resource Strategies Institute, a New York consulting firm, says this discussion is not new at all. Before computer people were targeted as tough management projects, there were engineers, scientists and financial people. "All of those types are oriented to formulas and analysis; people constantly get in the way," Quick says. "Most people don't make good managers at first. It's unfair to say technical types are worse at it than others."

Nonetheless, some, like Citicorp Investment Bank Assistant Vice-President Richard Lefkon, believe that when training technical people in management skills, the mountain must be brought to Mohammed. "Rules are of vital importance in educating the technical specialist to work broadly with people," Lefkon states. "As much as we say, 'Do as I do' or 'Pay attention to this,' a firm, observable rule or caution has a special appeal and clarity to a systems person. It's easier to concentrate on particular procedures or proverbs than to try and get people-oriented."

With that in mind, Lefkon offers approaches in managing staff, end users and people in other departments (see chart this page). Although he acknowledges that there is more to managing people than a list of rules, Lefkon points to the practicality of his ideas as a framework for building a manager.

"A broad concept may not seem vague to me, but it may be pure cotton to a technician I am trying to develop into a manager," he says. Lefkon drew on his years as a college professor and administrator in creating his suggestions.

Besides Lefkon's specific rules, a new systems manager should keep in mind a list compiled by Frank Stanley of the Computer Task Group, an Independence, Ohio, consulting firm. Stanley, in a report on DP personnel for Auerbach Publishers, Inc., points out that a few key practices make the difference between a successful and unsuccessful manager in an MIS setting:

• Being a good leader. A strong, confident leader provides employees with a feeling of security and an example that they can follow; a manager who expresses doubt and demonstrates a weak will can only generate uncertainty.

• Acknowledging noteworthy performance. Recognition of effort makes employees feel that their work is important and worthwhile. An employee will never mistake lack of criticism for recognition. Credit or recognition can be a simple pat on the back or a promotion, letter of recognition, salary increase or public acknowledgment.

• Delegating authority and maintaining control. Nothing fosters employee self-confidence better than properly delegated responsibility. Authority must be delegated carefully, so employees know what management's expectations are.

• Getting to know employees. People respond positively to those who take a sincere, personal interest in them. By taking time to get to know an employee, a manager can motivate while building close relationships and loyalty.

• Letting people grow. Although managers must always provide guidanee, they should encourage employees who know the objectives and who can figure out methods for attaining them to do so.

• Practicing participative management. Employees quickly develop a personal interest in their jobs and in the organization when asked to participate in traditionally managerial functions such as setting standards or solving problems.

• Providing challenging work. Employees should be constantly challenged; they should be hired so that they can grow into their positions and eventually into positions with more responsibility.

• Communicating. Managers should invest in training for themselves in topics such as effective listening and verbal and nonverbal communication. Effective communication can increase a manager's perception and greatly enhance his ability to successfully implement motivational practices.

> ❞
>
> ***'Most people don't make good managers at first. It's unfair to say technical types are worse at it.'***
>
> — Thomas Quick
> Resource Strategies Institute

Where to begin: Start at the top

Not surprisingly, the companies most successful at training MIS people to be managers are those in which senior management provides the most support to that end. Training across all departmental borders has long been a corporate fair-weather friend: there when times are good, gone when times are tough.

In the cacophony of competition, training is often the first to be overlooked. "Most companies don't do a good job at making anyone a manager," Quick says. "It's a lot of lip service. When I hear senior management say, 'People are our best assets,' I just want to run and hide. It never filters down from the top. The company might send someone off to school, and he comes back with lots of new ideas. The first thing he hears is, 'We don't do it that way here.' "

Greg Sherwood, director of training management for Advanced Systems, Inc., an Arlington Heights, Ill., training business, concurs. Companies do not have time to train, but the managers cannot become more productive unless they do, he says. "Training is the thing that never gets rescheduled after it's canceled," he adds. "If it is not tied in some way to the learner's career development or job performance, training doesn't happen. The cost of that absence of training is difficult to quantify, but it is a tremendous cost."

Companies such as IBM or Arthur Andersen, which take training very seriously, feel strongly that the investment pays off. According to Bergstein, "We spend $5,300 per person annually on training. A technical person joining Arthur Andersen receives more than 1,100 hours of training in the first five years. They receive technical and design training but also learn to administer projects, create work programs, interview and motivate others. It's a very task-oriented environment."

Bergstein says that it takes four or five years before someone is ready to step into a supervisory role, but to be an effective manager can take even longer. "There are a lot of things that go into managing, and it can take 10 or 15 years before someone really knows how to do it."

The technical staff faces other training burdens as well. Simply keeping abreast of changing technical advancements is a full-time worry. The "soft" issues surrounding management training often take second place. According to Sherwood, the successful company must clearly define the technical manager's role within that organization. The root of the problem in many places, he points out, is that candidates for supervisory positions are never offered a clear profile of what the company wants its managers to do. "People can learn leadership, but what does it mean within your organization?" Sherwood asks. "It must be defined."

Ken Hamilton, vice-president of MIS for Manufacturers Hanover Trust Co., agrees. "The biggest problem is teaching new managers how things are done in our culture, how to work within the firm's environment. It's one thing to teach someone how

Continued on page 48

A TRAINER'S TIPS ON HOW TO MANAGE

Richard Lefkon, assistant vice-president of Citicorp Investment Bank, says that a few clear tips and proverbs can be invaluable tools for training technical people to be managers.

☑ Managing Your Department

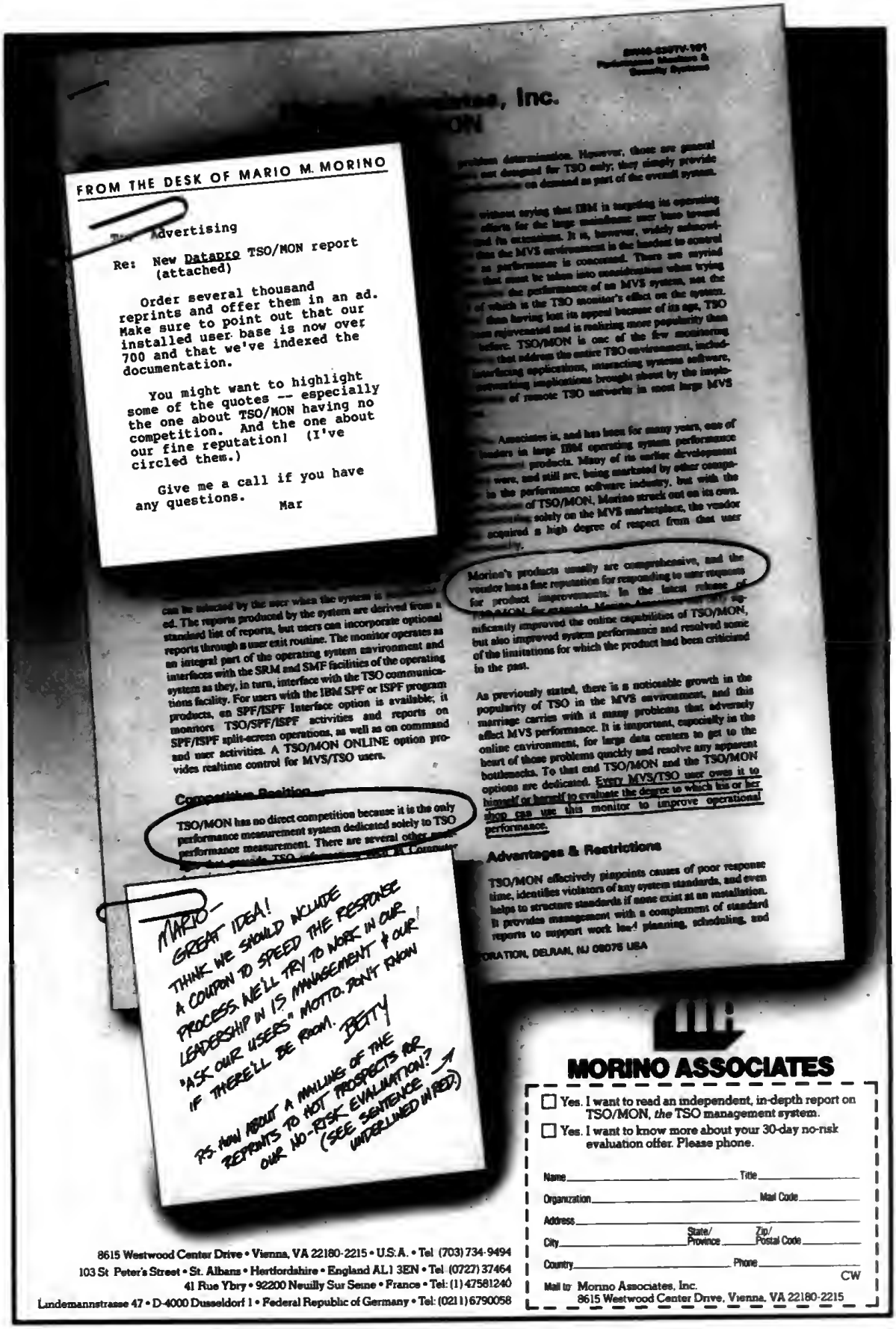
1. Don't wait for perfection; if it works, hand it in.
2. Test the program as you go; don't wait until you finish.
3. With two people on a keyboard, one is learning; admit it.
4. Don't get stuck in interesting puzzles; ask your neighbor.
5. You can argue with your boss if the door is closed.
6. Always ask a favor; admit it and make someone feel good.
7. Your people's success is yours; detail praise by name.
8. Break down programming to less-than-a-week milestones.
9. Avoid surprises; prepare your boss so there won't be any.
10. If your pet project is axed, smile and ask what's next.
11. Negotiate and fix assignments at your weekly meeting.
12. In the end, one opinion counts most: Your boss's.

☑ Managing Users

1. Hand the new report to the user in person.
2. Don't circumvent your service request process.
3. Schedule "changes to changes" separately as Phase II.
4. Get acceptance conditions in writing before starting work.
5. Never deny a program flaw; schedule the fix.
6. Publish the details of user service requests weekly.
7. Convey what the user needs to know; don't overelaborate.
8. Stick up for your team and boss; hurting them hurts you.
9. Make sure all hardware is working before it is needed.
10. When you have no recourse, grin your broadest and say yes.
11. Avoid butting into contests among users.
12. If the user is satisfied, you be too.

☑ Working with Other Departments

1. Don't do somebody a favor unless it is valued as a favor.
2. Avoid memo wars if possible; covering yourself doesn't.
3. If called at 2 a.m., ask, "Did you look in the Run Book?"
4. Let programmers help out for half an hour without authorization; then you take the flak.
5. Preplan all important meetings and calls; role-play some.
6. Instead of no, say, "Let me check with my management."
7. "Closure" is golden; you can't finish a task without it.
8. To find a cause, get all the finger pointers in one room.
9. Consider your team your family and act accordingly.
10. If someone is never reasonable, his boss wants it so.
11. If a big shot picks a fight, be nice but alert your boss.
12. Make sure official minutes appear after negotiations.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Re: New Datapro TSO/MON report (attached)
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Continued from page 46

to organize their time, how to plan, how to communicate better. But how does that fit into this environment?"

Although most Fortune 500 companies have instituted management training courses, those programs are often offered company-wide and do not make any specific provisions for MIS. Boeing Computer Services Co. instituted a series of premanagement courses for management-bound employees. Employees must be recommended by their department heads to be eligible.

In addition, Boeing offers one-week "Managing for Excellence" seminars for senior managers and a series of courses on effective presentation, writing and speaking. Jim Church, Boeing's general manager in charge of the education training division, points out that all the courses are corporatewide despite the fact that "we find that DP needs these skills more than most."

Church says there is no inherent reason for technical people to be more difficult to train. They get in trouble, he explains, when they start to talk in jargon, forgetting the people they are speaking with come from dissimilar backgrounds. Technical people tend not to tolerate well those who do not know technology.

Looking outside for a training solution

As any human resources administrator can attest, there is no lack of courses, programs and seminars on management training or consultants to administer them (see list page 58). Often that cornucopia of offerings presents a problem in itself. Who decides which courses are best suited to the particular MIS department, and how can one measure the value of a specific course or seminar?

Index Systems, under Popper's guidance, this month began its Index Institute, a monthly series of seminars focusing on the management and strategic uses of information technology. The institute is sponsored by 12 large corporate clients of Index.

"We found that these companies have a lot of technical people with educational needs that are not being met," Popper says, "especially how to be a more effective manager and create a more effective business function."

The target student, Popper says, is the middle-level manager — the head of the information center, project leader or systems analyst — who lives at the boundary between MIS and the users.

"There is a real need there for good training," he says.

Some companies, such as Sherwood's Advanced Systems, will go in and run the entire training program for the MIS department.

This arrangement can cause friction with corporate personnel, but Sherwood insists that it can be advantageous because MIS tends to trust consultants more than corporate personnel.

While the plethora of day- or week-long courses offered by consultants or trade groups such as the American Management Association provide valuable insight and training opportunities, it is clear that such training is simply not enough.

"I get companies asking me to change these people in one to three days after a lifetime of conditioning," Quick says.

Universities are slowly realizing that MIS is a worthy discipline and several have instituted wide-ranging curricula tied in with either computer science or business degree programs.

At Boston University, the master of science in MIS degree program focuses extensively on management training with a concentration on data management. "Our contention is that technical knowledge alone just isn't going to solve business problems," says Michael Lawson, director of the university's MIS degree program.

To that end, this program requires that students, in addition to technical MIS training, learn applications orientation and develop management skills. Students must participate in semester-long internships within corporate MIS departments and produce finished MIS-related projects to receive their degree.

Within the management training portion, Lawson points out that stress is placed on MIS as a strategic function. "We want them to understand that MIS can no longer just be reactionary," Lawson says. "It must have a mission for itself and links to the rest of the organization. If they don't create a long-range organizational plan, they tend to get jerked around a little."

Lawson also emphasizes the importance of the technical skills as partners with management abilities. "Organizations will not be able to put vanilla-flavored managers in MIS roles. They must have the technical skills, because technical issues can kill you," he insists.

With that combination, Lawson is confident that the next wave of senior management in certain industries will come directly from MIS.

Selecting the right management candidates

The crucial first step in training technical people to be managers comes in choosing the right candidates. Disaster stories abound about technicians who, having reached the highest level they can achieve, are pushed into management slots and

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COMPUTERWORLD

Interview

For management training, Avis tries harder

When it comes to training technical people to be managers, few firms try harder than Avis Rent a Car System, Inc. The Garden City, N.Y.-based company, under the direction of David McNicholas, senior vice-president of systems marketing and development, has implemented a series of programs aimed at creating better technical managers and more business-oriented systems people. Computerworld Senior Editor Glenn Rifkin spoke with McNicholas about Avis's approach and philosophy.

What programs do you have in place to train technical people to be managers?

We have a checklist and a set of reviews. We are lucky because we are such a service-oriented company with so many people that we have a very strong training department. Worldwide training ranks very high in the organization. So lots of capability has been developed over the years to teach people how to interview, to appraise, to motivate. And we use a lot of these internal company courses and programs for introductory supervisory skills.

The key thing we do is go to our first-line supervisors and have them take someone who has been a technician and make him a project manager or supervisor for part of the technical staff. The first-line supervisor then spends time with that person and attempts to get them to look at things from the opposite side of the desk. People who are being appraised or interviewed have some clear idea of what the process is, but they don't tend to think about what it looks like from the other side.

Are these programs set up specifically for MIS or are they part of corporatewide management training?

These are Avis management training programs, not specifically set up for DP.

Is there anything in-house set up just for MIS?

We have technical courses but not for supervision, not for moving people from being a contributor to being a supervisor.

Would that be necessary?

No. As a matter of fact, I'd be inclined against it, because our objective is to make people think in terms of their career being within the company, not within the profession. We think that the large turnover issue comes from the fact that MIS people tend to think of themselves as part of the profession — "I need to work on the bigger machine, the new software" — and that whole attitude that says "My growth as an individual is a function of how I grow within the DP profession." We think there's an advantage to having them think, "My growth as an individual is a function of how I grow within the company."

Do the people doing the supervisory training over any that it is more difficult to train the technical people than others in the organization?

I've never heard anything about that. DP people are sometimes considered to be a little different, particularly since they tend to be bright and overly rational. They tend to be overly analytical.

Sometimes loners, sometimes self-motivated, not interested in working in groups?

Sometimes those characteristics are there, but the kind of people you select for supervision have shown some interest in dealing with people, or else why select them?

How do you select them?

We try to select people who are developing the kind of attitudes we are interested in. We are looking for people who are able to deal through other people, because we do recognize that supervision is different from being a good technician. About seven or eight years ago we developed, with the encouragement of personnel, a career path that allows you to make a lot of money without being a supervisor.

The problem we ran into was people who wanted to be the boss, because that was how you got the money, the car and the bonus. If that's what you want, but you really don't like working with people, we don't want to force a situation where the only way you are going to get those nice things is to take a supervisory job. So we built a career path that allows you to advance pretty far up the organization without having people working for you.

So you advocate a dual career path.

You just have to recognize that some people want the reward and are very valuable to the company. And you don't want to put them in a situation where the only way they are going to get ahead is to do something they are not good at and don't like doing.

How do you encourage people to try to develop managers from within?

The annual reviews of those in the management structure have three components: What projects you are working on, what you are going to do to develop your own skills and what you are doing to do to develop the people who work for you. They are relatively equally weighted. So if you are not doing things to develop your staff, you are going to have troubles in your appraisal even if you are doing well with your projects, because developing people is one of our major roles.

Do you have success stories in which you turned a technician into a top-notch supervisor?

Yes, in fact, most of the people who are in supervision came up through the organization. Neither the head of computer operations nor the head of systems had any interest in being in supervision when I came here eight years ago. They were actually negative on the idea.

Avis's McNicholas

Neither the head of computer operations nor the head of systems had any interest in being in supervision when I came here eight years ago.

What turned them around?

You come to a point in time where you tell your people, "Either you take the job or I'm going to have to hire someone to take the job who will tell you what to do. Now which would you rather have?" That starts them thinking about it. They think, "I'd rather decide how things are getting done rather than have somebody come in and tell me how to do it." You start people thinking they have the capability.

How has training people to be managers changed in the last 10 years? Is it more focused on the need to be more part of the business?

Yes, particularly at Avis. I've been here for eight years, and when I came the tendency was to hire from outside. You had people who became the manager or the director and their objective was to build their resume so they could go to another company. It made for a lot of turmoil and turnover.

Now we very seldom hire from without at the higher levels. We train from within. We consciously develop an attitude of being part of Avis, and we try not to have high turnover. We're comfortable with the number of success stories we have in the projects and operations.

How do you teach technical people to be part of the business?

That scares a lot of people. You have an inherent value in being a good technician. You can always go get a job. But they are afraid that when they become identified with a company function, they'll lose something in terms of that technical qualification. One of the things we do is to make sure they understand that whatever they've learned before, they'll get credit for as they go forward. I don't think the fear is warranted.

More specifically, we have a one-week corporate course that teaches station managers about fleet accounting, how you sell, what the daily duties are, what the various departments do and how to use them. We took that course and adapted it slightly to the technical services group. We send them to this course to learn how to rent cars, how the fleet is financed, how we do accounting for the fleet, how we sell the cars and how the sales department operates. Second, we send people to a course on how to rent cars at the counter and how to use the computer system. Avis is one of the most heavily computerized companies you are going to run across, and so one of the basic things to understand is what goes on at the counter. Because while the programmers are thinking in terms of what a computer terminal does, when you actually go out there and rent a car and there is a customer who wants a set of keys and instructions and has a charge card, it's intimidating as hell.

They don't object to that?

It's scary. But they all come back saying, "My god, all the things I learned, I really understand so much more." Most people don't want to do it, but when it's over they think it's been valuable.

We are constantly asking people, especially those who buy equipment and make proposals for major systems, "If you owned the company, would you do this? Does this make sense?" We try to move their thinking to look at it from a businessman's standpoint, not a technical standpoint. "Does this rent cars? Why do we want to do this?"

We'll send people out to the sales offices, on sales leads. And we will send people to presentations to the sales team, we'll send them to customer calls. It works wonders. There's nothing like calling on a customer like United Airlines or American Airlines to really change technicians' attitudes. They start to realize what it's all about in terms of renting cars.

Will all this training be a route to senior management?

That is something we are working toward. There are only three senior vice-presidents in the company, and I am one of them. So they see that there is a chance for them to grow to a very high level within the organization. But in the company I worked for before, the manager of accounts payable was the guy who developed the accounts payable system. And we haven't done as much of that here. We'd like to have a number of people who were project managers working as managers in the company. We haven't been as successful with that as we'd like to be. ■

Competency planning leads managers through tough terrain

By STEWART STOKES

Several years ago, a best-selling book satirized the manager's climb into the corporate hierarchy in rather disturbing terms: "Managers get promoted up to the level of their incompetence." The author described the phenomenon of managers being promoted into jobs one level above the position they are most competent to perform. When this happens, the author suggested, organizations are managed on all levels by incompetents; performance erodes, customers and markets vanish and the business begins to self-destruct.

This thought-provoking theme brought the author fame and fortune; it brought others a forum for the consideration of competency as it applies to managing an enterprise, department or group of individuals. MIS is a business within a business. It is a staff and service function with a mission to produce information that will enable line managers to administer, manage and lead their departments in a more efficient, effective and profitable manner. MIS operates in a fishbowl and sometimes seems like everyone's favorite whipping boy. The MIS manager is like the point man in combat: exposed to enemy fire from the front, friendly fire from the rear and all while trying to negotiate ground that is unfamiliar and — occasionally — threatening.

Forgive the analogy; I don't mean that the MIS manager is an embattled species. I do suggest, however, that the MIS manager has a tough and thankless job to do. He must lead, manage and coordinate at the same time, and he must do it all while trying to solve problems he probably does not fully understand.

The "map" that guides MIS managers through difficult terrain includes an understanding of competency. Competency is defined as what they need to know, understand and be able to do to be successful in their organizational culture and environment — and what attitudes and values are appropriate for managing in their environment.

Competency is not — or should not be — a concept that is overly theoretical, obtuse and arcane. It is — or should be — a concept that is practical, usable and easily understood and applied. When I refer to "competency development," I don't mean training and education in the abstract — that is, gathering bits and pieces of information that someday may be useful. It is the mastery of specific, career-related knowledge, understanding and skill that will enable the MIS manager to do his job better, perform essential tasks more effectively, master the subtle political processes more readily — all while making a continuing contribution to accomplishing business objectives and fulfilling corporate mission and purpose.

Visualize your job and responsibilities as you answer the following questions:

1. How has your organization's DP/MIS activity changed during the past three years?
2. In what ways is your job changing?
3. What is the most important knowledge requirement for success in MIS management in your organization?
4. What is the most important skill (or behavioral requirement) for success in MIS management in your organization?
5. What important trends do you see developing that will affect MIS, your organization and your career?

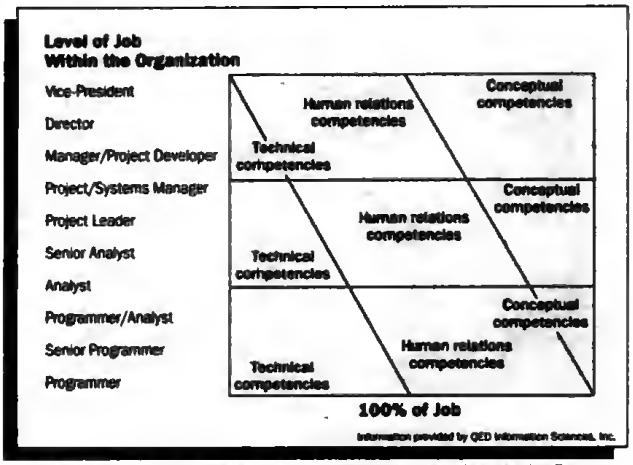
The diagram (see chart this page) is of particular importance to MIS managers as they place their personal competency requirements in perspective. It is based on Robert L. Katz's classic *Harvard Business Review* article, "Skills of an Effective Administrator" (September-October 1974). The diagram suggests that all jobs on every level within a unit, department and organization consist of three distinct levels of competency or skill: technical, human relations (or interpersonal) and conceptual. The higher that one climbs on the professional or managerial ladder, the less important are the technical skills and the more important become the conceptual competencies. The human relations or interpersonal competencies are important on all levels, but the mix and complexity change.

The technical competencies are those "doing" activities and specialized knowledge and skills that are a large part of every job. The problem they pose for the developing MIS manager is that they are what the manager is most comfortable with and likes to do best. Hence they tend to take up a disproportionate amount of his time. The manager often justifies this expenditure of time and energy by rationalizing, "I can do this better and faster than anyone else on my staff, so I will continue to do it." The problems encountered when trying to do everything soon become overwhelming.

Human relations competency refers to the critical people issues present in every job — and I'm not referring to the tired "getting along with people" cliche. I mean knowledge, understanding and skill in organizing individuals into a team, creating a climate for self-motivation, establishing realistic goals and objectives and acting as internal consultant and change agent.

Conceptual competency refers to the role of MIS as a business within a business. Thinking this way sets the tone for understanding the significance of projects to the various internal clients and why clients behave as they do when surrounded by system issues. Business is dynamic and just does not stand still long enough for MIS to get its desired fix on the problems. The more conceptual knowledge MIS managers have about their clients or customers, the more effective they and their staff will be.

COMPETENCY DEVELOPMENT BY MANAGERIAL LEVEL



Technical expertise is less important as technicians rise through the firm.

Stokes is vice-president of education programs for QED Information Sciences, Inc. in Wellesley, Mass.

Critical conceptual competencies include understanding the company's products, markets, strengths and weaknesses, strategic thrust and long-range planning — and the notion of using information as a strategic resource.

This model also becomes the basis for understanding the key managerial competency of delegation. The developing MIS manager cannot continue to do all that he would like to do technically, but organizations are filled with managers who cannot give up doing the familiar technical assignments for which they are responsible. The result? Frustration, demotivated subordinates, burnout.

The solution? First of all, recognize that you cannot do everything, and everything is not worth doing. Focus on your job essentials — those relatively few tasks and processes that will give you 80% of the results you want. What technical aspects of your job should you delegate or disregard? What new interpersonal skills — effective speaking, conflict resolution, influencing, listening, negotiating, internal consulting, managing change and so on — do you need to develop? And what conceptual understanding do you need?

Negotiate with your manager regarding the essential expectations you both have about your responsibilities and accountabilities. What do you and your manager feel are most important and least important?

Plan your own training, education and professional development in a more purposeful manner by focusing your activities on the three

> ***The developing MIS manager cannot continue to do all that he would like to do technically.***

levels of competency and determining what combination of competencies is right for you at this stage in your career. Ask yourself how your job is evolving, how the company is changing and what new needs are affecting the strategic, managerial and operational aspects of the organization as a whole and the MIS function in particular.

Also, remember your distinctive corporate and MIS department cultures and determine the attitudes and values most appropriate for survival within these cultures. Plan with a purpose.

In other words, when it comes to your own professional development, be a proactive MIS manager. ■

Continued from page 48

find themselves unhappy and forced to leave the company. According to Hamilton, "The worst thing you can do is force a valuable technical person into management, because you then lose a great technician and gain a crummy manager."

Unfortunately, most corporations have yet to address this sticky issue. Some enlightened organizations have instituted a dual career path, so that technical people can grow into higher salaries along the corporate ladder without managing others. Yet that solution may not be adequate in certain types of businesses.

In the banking industry, for example, Hamilton points out that there remain certain prerequisites, including managing a given number of people, to achieving certain levels.

"Someone who knows the technical area cold is invaluable to the company and should be able to be a vice-president without being a leader of other systems programmers," he says. "There should be a niche for those kind of people. I'd like to see them do away with bank titles and give good fundamental titles here. But titles like 'vice-president' are still coveted."

As information systems become more integrated and integral to the business function of a company, it is becoming easier to identify potential managers. The profile of systems people entering the professional ranks has changed, and resumes with business or liberal arts degrees are sprinkling into technical strongholds. The next generation of MIS management appears to be inclined to view itself as a business rather than as a

Continued on page 54

Creating a management development program for MIS

By MADELINE WEISS

"Managers are born, not made." Based upon the paucity of effective management development programs, one could assume that this quotation indeed embodies the operating belief in many MIS organizations today.

In my work with MIS organizations, I frequently hear complaints from MIS professionals concerning their managers' inability to meet their needs as systems professionals. One complaint is that their managers do not provide adequate guidance in planning and controlling projects. A second complaint is that MIS managers do not provide the models of effective management that this crop of future leaders needs. Third, their managers do not provide the feedback on job performance and support needed to develop their skills, perform at the high levels expected of them and maintain reasonable levels of stress.

In a view from the top, MIS executives voice similar complaints about the managers in their departments and include additional ones: The managers do not have the political, marketing and communication skills required to work successfully in today's changing MIS environment; they do not adequately appreciate the significance of understanding the organization's business and therefore do not communicate that significance to their staff; they do not run their work units as businesses; they do not provide an environment that keeps top MIS professionals from leaving; and they do not creatively search for new opportunities to serve their customers.

Experience convinces me that the reason for the lack of effective management development programs is not quite as simple as saying that managers cannot be developed. The reasons are much broader. The ongoing demands of business allow managers little time for days away from their offices for training.

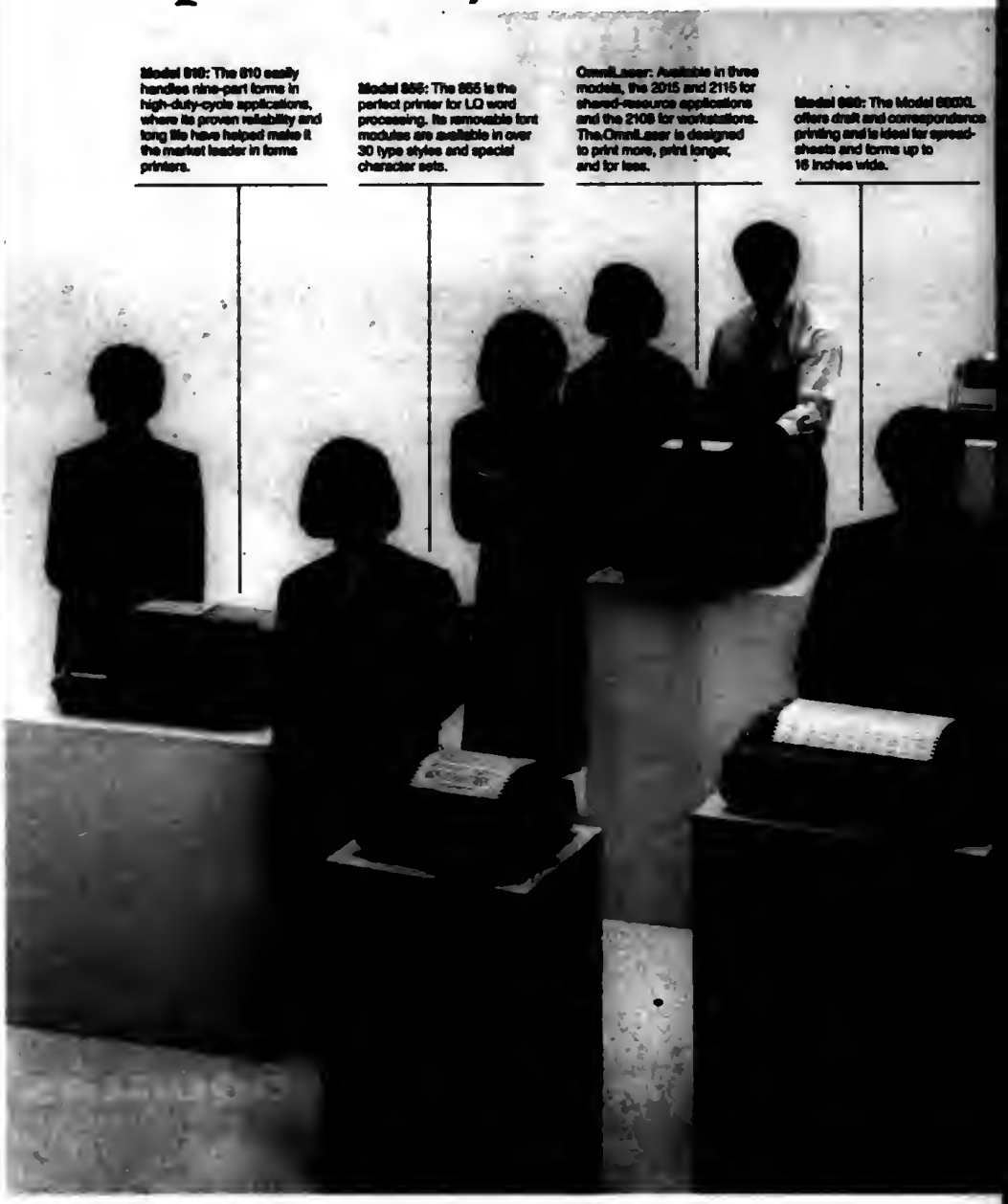
Moreover, technical training frequently takes precedence over management subjects, which are often considered common sense anyway. Past experience attending management training seminars that did not address management issues specific to MIS or that did not relate concepts to practical situations have also caused MIS organizations to curtail management training. Still another cause of inadequate programs is the lack of reward given to managers for developing the managers and professionals who report to them. With little direct incentive, managers have no trouble finding reasons for not sending supervisors who report to them to these seminars.

As the pressures on MIS organizations rise, the need for effective MIS managers increases as well. Despite the reasons for past lack of success, I have been working with MIS organizations to implement effective management development programs. The programs often have several components:

- Formal in-house management training program.
- Informal one-on-one coaching.
- Planning and problem-solving sessions with the manager's work unit.
- Follow-up informal workshops for managers.
- Ongoing program of short seminars on subjects of interest.

Formal training programs. The formal training element is based upon the concept that effective management in an MIS environ-

Weiss is president of Weiss Associates, Inc., a consulting firm in Bethesda, Md., that specializes in management and organization development for MIS departments.



ment requires understanding of the dynamic interrelationships among the manager, the managers or professionals who report to him and the organization. Understanding these interactions involves exploring the components of each of these three elements separately and the impacts of each on the others.

In setting up a program, the first training modules should focus on the MIS manager as an individual, highlighting the effects of one's values, assumptions and preferences on organizational performance.

The next modules should center on the manager-subordinate relationship, emphasizing behaviors and skills that are critical to effective management.

The final modules should explore the organizational context and its effect on the behaviors of managers and their subordinates.

All of the program's components should rely heavily on experiential learning, because I strongly believe that adults learn most successfully by direct involvement — by trying out new skills as they are presented and discussed. The exercises are designed to relate skills and concepts to specific job-related situations in the managers' organization.

One-on-one coaching. This component serves to augment the formal management training program when managers are having trouble dealing with difficult subordinates. Managers sometimes find it awkward to discuss such situations in the training setting since other participants may know the subordinate in question, yet they find an objective perspective helpful in analyzing the situation and developing strategies to improve it.

Planning and problem-solving session with the manager's work unit. While one of the modules in a typical formal program focuses on planning, I have found that planning is internalized most effectively throughout the process of creating plans in the work unit. Working with the manager and his work unit, sessions are conducted in which the group plans together. Through the process, managers come to appreciate the value of participative planning and problem solving and learn how to use them effectively.

Follow-up informal workshops for managers. While participating in the series of modules, the managers often become quite close, in effect becoming a support group for each other. In follow-up informal workshops, they have the opportunity to continue the learning process together, helping each other as problems and issues arise.

Ongoing program of short seminars on subjects of interest. New subjects of interest to MIS managers are always arising. These subjects can be presented in short seminars to which all managers are invited. One client MIS organization invites leaders in the management field to conduct seminars based on books of particular interest to its managers. I attribute the success of this program to several factors.

> ***Managers have no trouble finding reasons for not sending supervisors who report to them to training seminars.***

First, the executive who heads the organization participates actively in the seminars, thereby demonstrating his commitment to management learning and growth. Second, the seminars are not simply lectures summarizing the contents of the books selected. They take a book's premise and turn it into an action-oriented exercise for the group.

Creating a management development program such as the one described requires active commitment on the part of MIS executives. Managers quickly pick up the signals as to whether or not developing first-rate MIS managers is a high priority to senior management.

In my experience, when that commitment exists and an effective program is implemented, the return on investment is excellent and the impact on the organization is far reaching. ■

Continued from page 51

technical function, and interest in management positions will be strong in this group.

For the current generation, the lines are more clearly drawn between technical and nontechnical types, and thus leadership qualities are more difficult to discern. Aetna's Johnson adds that the difficulty is exacerbated by the current changes swirling around MIS. "It requires a different mind-set than in the past. Management skills are much more important when you are in the midst of change," Johnson explains.

At Pepsico, the personnel department instituted a "success profile" for potential managers that identifies a list of 35 management skills — such as giving feedback, planning, motivating others, leadership, delegation, conflict management and oral and written presentation capabilities — that emerge during a candidate's career.

"We like to see a person exhibit those skills before becoming a manager," says Joanne Coviello, director of information systems at Pepsico. "We stress a person's ability to deal with the business function."

Pepsico also invests heavily in succession and career planning with individuals, Coviello points out. A systems person can direct the path of his own career, and his supervisor must ensure that he is given the proper experience to prepare him for the next step.

"The main thing to remember is that there aren't hoards of management positions open. You only need a few," Coviello says.

> ***'The worst thing you can do is force a valuable technical person into management; you then lose a great technician and gain a crummy manager.'***
>
> — Ken Hamilton
> Manufacturers Hanover Trust Co.

The consultants believe that finding even those few is tough. Arthur Andersen's Bergstein suggests that companies that turn out a lot of managers need a structured evaluation process tied to the company's compensation program. "It needs teeth to it," he says. "If the message is consistent, people will get it."

Index's Popper suggests that technical people should "self-select" whether to be a manager or not. A systems person is aware of whether he has the potential to be a good manager. Popper also recommends management skill building through not only courses and seminars but through such techniques as job rotation and apprenticeships. "Maybe the best way to determine if someone is qualified is to put them in a new role for six months," he suggests.

Unfortunately, it is the rare MIS department that can afford to let anybody, let alone its best people, shift jobs or leave for extended course work for any length of time. Even week-long seminars burden the MIS department that is straining to meet user demands.

Also, despite the validity and good intentions of management training and prescreening, many continue to believe that only stripes earned in battle truly create the good manager. On-the-job training, they say, has no substitute. "It's hard to teach managers how to manage in a university setting," Johnson says.

"The challenge is not turning a technical person into a manager, but getting good managers at all," Coviello adds. The question remains, Is managing an inherent skill or can it be taught?

Realistic expectations: Accepting the risks

"Many people," Sherwood says, "don't consider the benefits or the risks of becoming a manager." This, he points out, is a mistake, because there are clearly greater risks in being a manager than in being a technician. "Technical people are not taught to accept risks. They sort of feel that if they make a mistake, they'll be banished to maintenance. Not a lot of people will want to be a manager if they see one of their friends being torn to pieces for a mistake."

In addition, expectations for what managing will be like are often far from reality. As Quick puts it, "The principles of management are easy; the practice is difficult. In reality, if you have 20 people reporting to you, there will be 20 different sets of motivating factors. Technical people have to learn that managing people is a one-on-one, difficult and complex thing to do. That may be why technical types don't manage well. There is so much uncertainty."

In fact, perhaps the most difficult transition a new manager must make is learning to give up the hands-on work and gain satisfaction through the achievements of others. "For a technologist, there is always the temptation to do the work himself," Popper says. "He thinks, 'I can do it myself in six hours.' It's a matter of letting go of your own technical expertise and taking up management technique, being proud of what you've managed rather than what you do yourself."

Continued on page 58

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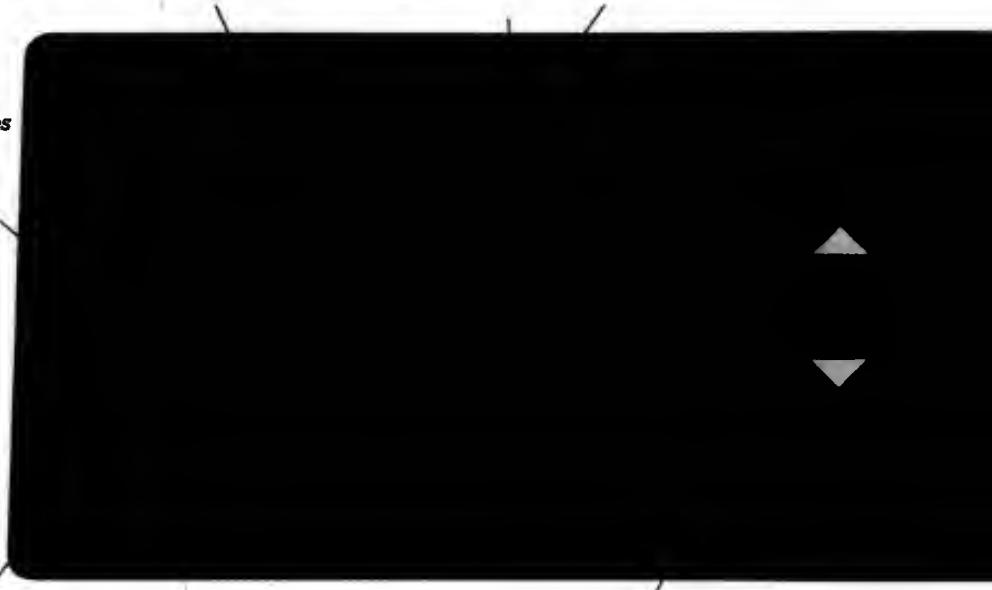

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Continued from page 54

"For a new technical manager, the source of well-being was in the work he used to do," Sherwood adds. "As a supervisor, he may go back and mess with people's work because he needs an anchor."

Keeping his own staff happy is just a fraction of the new manager's job. As Lefkon points out, a manager must also interact with end users and other departments within the company. That role may require the manager to take on the function of being the bad guy, Lefkon says.

"You must establish some rules that allow your team to be perceived as cooperative, but at the same time, you are not getting resources stolen without chargeback," he explains.

"For example, let your people work for another group for half an hour and then have them say, 'My boss won't let me help out more than that without a charge.' This lets your subordinates off the hook."

In fact, consultants like Sherwood say that the increased interaction between MIS and the end user has mandated that training be the result of a coordinated effort between the two groups. To create the right curriculum, Sherwood says, "We're encouraging MIS to use user departments for training. You sit down with the user to work out a course.

"Users want a partner to take an active role in the overall concept of the business plan," he adds. "If a DP supervisor asks a user, 'What does your boss want from you?' or 'How is your business going to change?' that's very impressive. That is what may draw more people toward management."

As MIS continues to grow in stature within the corporate world, the need for competent technical managers will increase. Despite the attention paid to this need up until now, it is clear that business can and must do a better job in training technical people for interpersonal interaction.

This void creates tremendous opportunity for young technicians. "Young people should realize that there is a great opportunity here," Bergstein says. "And business should realize that if you hire people off-campus, spend a lot of money training them, you can do your best development in-house. You tend to create a culture, and this makes the ability to manage even better." ■

A training sampler

The following sampling illustrates the range of opportunities available for both general management training and training specific to systems people.

Stanford Executive Program — An eight-week program for top executives with 10 to 15 years of experience; runs from third week in June through mid-August.. Contact: Penny Brommer, assistant director, Stanford Executive Program, Graduate School of Business, Stanford, Calif. 94305.

Harvard Program for Management Development — A 13-week residential program run twice each year for middle- and upper level managers who have been promoted or have taken on new responsibilities. Managers must have 10 to 15 years of experience. Contact: Harvard Business School, PMD Program, Glass Hall, Soldiers Field Road, Boston, Mass. 02163.

Boston University's Master of Science in MIS program — A full-year 12-course program through Boston University's School of Management intended for graduates of management programs. The curriculum includes several courses that focus on managing the information systems function. Contact: Boston University, School of Management, MSMIS Program, 621 Commonwealth Ave., Boston, Mass. 02215.

American Management Association — Offers a wide variety of management training courses, including specific programs for training technical and systems people to be managers. Contact: Ellie McKenney, American Management Association, Extension Institute, 135 W. 50th St., New York, N.Y. 10124.

The Index Institute — Monthly three-day seminars focusing on management training and strategic use of information for information systems professionals. Contact: Index Systems, Inc., Five Cambridge Center, Cambridge, Mass. 02142.

Advanced Systems, Inc. — A technology training resource company that offers three- to five-day on-site seminars for technical people in management training as well as end-user computing, manufacturing and engineering. Contact: Advanced Systems, 155 E. Algonquin Road, Arlington Heights, Ill. 60005.

QED Information Sciences, Inc. — Specializes in computer-related professional development, educational training and publishing. Offers 125 different instructor-led training and instruction seminars on technical and management training. Contact: QED, P.O. Box 181, Wellesley, Mass. 02181.

Weiss Associates, Inc. — A consulting firm that specializes in management and organization development for MIS departments. Contact: Weiss Associates, 5711 Bent Branch Road, Bethesda, Md. 20816.

In Depth

Technology: Invader or protector of privacy?

CW PHOTO BY O'CONNELL/LADOUCEUR

Everyday DP decisions can unwittingly invite invasions of privacy. • MIS will be publicly held responsible for major violations. • Top employee concern: work monitoring.

By SANFORD SHERIZEN and GARY MARX

Business executives seldom consider privacy a pressing issue. If they pay attention to it at all, they view privacy as a matter of protecting corporate proprietary information. Less often, executives consider the right of employees, customers and clients to be free from the collection of unwarranted personal information.

In truth, we may live with less privacy today than we did in the symbolic year 1984. Technological advances that George Orwell could not have foreseen have opened up new opportunities for highly intrusive, inconspicuous invasion of privacy. What today's commentators have not sufficiently explored is the idea that technology can also be used to protect privacy.

Corporations have generally not taken forceful action to protect either corporate or personal information. Now privacy has once again become a matter of congressional and public interest. How technology is ultimately used will depend largely on how corporate and government leaders make decisions. Action with respect to the privacy issue rests on the awareness and concern of nontechnical upper level executives.

Nebulous threat

Privacy is one of those intangible concepts that is easy to support in the abstract but difficult to make workable in concrete terms. The best understood threats to our privacy — misuses of credit or health data and government snooping on individual citizens — are easy to see. The less well understood threats are in some ways more threatening; the public may not know about them, but they slowly chip away at what we assume is inviolate protection of privacy and freedom.

For MIS and DP management, it is important to understand that many normally accepted processes have the potential to allow invasion of personal privacy. Apart from purposeful decisions to invade privacy, everyday data processing decisions can also create privacy problems. Such operating decisions may appropriately be based on strategic or efficiency grounds. Yet without consideration of the privacy implications, the rights of individuals can be negatively affected.

Consider the following examples of how information has become more exposed, requiring active corporate protection of privacy and adequate security for confidential data files:

- Because of increases in employer contributions to worker health plans, programs to control the cost of corporate contributions have led to increased corporate collection and use of employees' highly sensitive medical and mental health information.
- In an attempt to increase productivity, corporations have increased the monitoring of computer and telecommunications usage by employees. At times this results in private communications being reviewed.
- To protect corporate proprietary information, some employees are required to sign a waiver of their right to work for a

About the authors

Sherizen is a Natick, Mass.-based information and computer crime prevention consultant. Marx is an MIT professor specializing in the social impact of communications and surveillance technology. The two recently completed a report on work monitoring for the U.S. Office of Technology Assessment.

competing firm for a specified period after leaving the corporation, and the corporation may carry out surveillance to determine whether these conditions are met.

These examples suggest that finding the right balance between corporate practices and privacy rights is a complex task. In the process of seeking security, strategic advantage or cost containment, corporations may be violating legitimate privacy expectations. The failure to pay adequate attention to privacy questions can mean the violation of individual rights and expectations, employee dissatisfaction, lawsuits and negative mass media coverage.

> ***In the process of seeking security, strategic advantage or cost containment, corporations may be violating legitimate privacy expectations. The failure to pay adequate attention to privacy questions can mean the violation of individual rights and expectations, employee dissatisfaction, lawsuits and negative mass media coverage.***

The Privacy Act of 1974

The Privacy Act of 1974 is the major federal legislation affecting individuals. The legislation, passed during the turbulent era of Watergate and Vietnam, was written to protect citizens against government misuse of private information.

The act sets down very basic requirements for the government to establish mandatory standards concerning the dissemination of private information. It also allows individuals to check accuracy of information about themselves.

The framers of the legislation clearly assumed certain technical and social conditions. This was the era of batch processing — government agencies and large corporations were the major users of computers. The telecommunications industry was regulated and highly structured; its development and functioning were largely separate from computer systems.

The act failed to make adequate provision for the technological changes that have taken place during the last 12 years. One example is the increase in modem capabilities nationwide. The U.S. National Security Agency estimates that all the modems purchased in the U.S. in 1972 could together transmit about 600,000 characters per second. In 1984, a sufficient number of modems was purchased to transmit 220 million characters per second.

The speed of communications has also changed. According to the Office of Technology Assessment (OTA), with the increased communications capacity made possible by fiber-optic technology, it is possible to transmit at a rate of 100 average-length pages per second. This could permit the creation of centralized libraries with universal access.

Confidentiality considerations

Since passage of the privacy act, we have seen more widespread use of personal computers, network developments, merging of computers and telecommunications systems, deregulation and competition in information services, centralization and integration of data bases, increased speed and storage capabilities, greater system complexities and increased societal dependence upon system reliability.

According to a recent OTA report, "Automation of America's Offices," assessing confidentiality in an organization with new decentralized or networked office technologies requires consideration of a number of new factors:

- Low- or no-security physical environments in offices.
- An increased amount of finished and refined information in office automation systems.
- The mobility of microcomputers and their data storage media.
- Less sophisticated office automation users.
- Relatively or totally uncontrolled channels of data communications.
- A wide-ranging ability to add information to, copy or extract information from corporate data bases.
- Little or no hardware or software security protections.
- No assurance of how employees will use technical capabilities.

Consider the extent of interconnectivity in the case of one major corporation. IBM's W. H. Murray, in a speech before the 11th Annual Computer Security Conference, noted:

"In IBM, we now have a worldwide network of more than 1,500 mainframes and 200,000 terminals. Any user at any terminal can send a message or a file to any other user. A user can connect to any application in any of those 1,500 systems.

"Programs and even entire applications spread spontaneously through the network, usually without management direction or intent and often without management understanding or knowledge. Employees can access the network from their homes. Some vendors and contractors use it. . . .

"DP management did not plan it. They bought it and built it, but they

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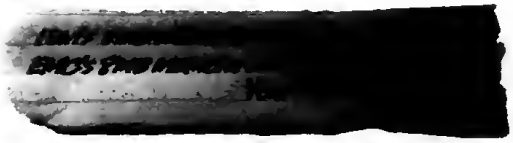

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were just as surprised as anyone else when they saw 'what God had wrought.' "

Taken over by technology

In essence, the privacy act has been overtaken by technology. While the act froze, technology continued to grow. The computer and DP industries rushed to develop new products and to find new market opportunities. The problem of privacy protection fell silently upon the shoulders of MIS and DP managers, who had many other tasks that generally took priority.

Today, the act is no longer adequate for the challenges. Other privacy protections are needed. There has been little to replace or to resuscitate privacy protections. State laws in general are not doing it, worker and consumer groups are not able to do it, and management for the most part does not seem to be interested in doing it.

Many technical solutions to privacy protection suffer from some of the same difficulties that information security does — namely, negative performance impacts, user resistance and avoidance, complex operating environments and lack of product robustness. It is time to rethink privacy protection.

> ***"In a world filled with uncertainty, it is easy to assume that more data is always better. From a privacy perspective, that clearly is not the case."***

Implications for DP management

Privacy is not generally considered a priority area of data processing. The lack of discussion or concern on the part of top corporate management is one indication of this. When was the last time corporate executives asked an MIS or DP manager about the adequacy of the organization's privacy protection? Information security is increasingly being put into organizations, but this security is directed mainly toward protecting corporate information rather than, or in addition to, employee privacy.

Information security methods often mention privacy, but insufficient implementation is the rule. In fact, computer security monitoring and DP auditing may increase the collection of information about individuals, crossing some lines of demarcation that traditionally protected privacy.

It is also well to note that the privacy issues involving computer data are nestled within a broader set of concerns involving employers and employees. This involves the corporation's desire for continually more information about employees. Consider, for example, current controversies:

- Drug testing.
- Medical screening that may result in excluding healthy workers who have a higher than average probability of developing serious

Continued on page 64

Do your automated reports report on you?

By ASHLEY GRAYSON

Word processing simplifies the official channel of business communications without affecting the human one. Total office automation intrudes into the unofficial personal communications space. To achieve its deserved impact, it should allow for human nature.

With all of us hoping for speedy acceptance of office automation, the paperless office and electronic mail, I wonder if adequate thought has been given to the psychological pressures of such a workplace.

These little-discussed aspects of electronically enhanced communications have already demonstrated some unusual side effects. In addition to drawing our attention to the ways in which people respond to technology, these odd aspects of automation represent opportunities — if they can be overcome.

Grayson is the founder of ADG, a high-technology writing services company in San Pedro, Calif. He served for 11 years in marketing for Digital Equipment Corp.

Built-in disaster modes

The advantages of the automated workplace are clear: less concern for the mechanics of getting words on paper, easier rewrites and changes to boilerplate documentation, fewer cases of "telephone tag" and swifter communication in general. With the arrival of optical disk storage, even the task of archiving appears as if it will become trivial: low in cost, ultimately reliable and undemanding of floor space. What can go wrong?

Several things can, and I think they must be resolved before full office automation can really boom. First, consider how much business communication occurs in informal interactions. If your divisional vice-president bumps into you in the cafeteria line and asks, "Whaddaya think of that new OA company?" you may reply in an equally offhand manner, "Remember Viatron," and

that's that. But if you get an electronic mail memo from the same vice-president asking the same question, you may call in your whole group and produce a 50-page report: lots of hours spent answering a question that was not a serious question.

Thus you can appreciate the first psychological problem of office automation: it couches the idle query in the mold of a call for results. Like the little boy who cried wolf, electronic mail will get prompt responses until people wear out.

Notice that word processing does not have this problem; it simply provides better tools to forge the classic paper document. So an organization with a successful history of word processing may be in for a few surprises when it automates the entire office.

If the sensitive manager foresees this and does not send the electronic query, he is depriving himself of your opinion and you of the opportunity to contribute. A solution might be to flag hierarchical levels of communication with keywords or different colors of background indicating the sender's level of urgency, but this has built-in disaster modes also. No one will voluntarily flag his correspondence as unimportant. Not only would he never get replies, but the sender's management would ask why he is bothering the troops with unimportant messages.

Thus in a hierarchical scheme, everyone's message would always be marked "top priority."

Phony meeting syndrome

This brings up the next problem with office automation systems. The phony meeting syndrome was discovered by one of the first companies to implement a broad-based office automation system. It not only allowed participants to send and receive electronic mail and operated a personal task reminder file for each individual, it scheduled meetings automatically. If you wanted to call a meeting of a particular group, the computer would compare everyone's calendars and schedule the meeting when all were free.

The company discovered that managers were blocking out chunks of their own calendars with phony meetings so as to appear more in demand than their peers. This is just one example of how a system designed to make better use of people gets subverted by its beneficiaries.

I suspect this perversion of the meeting planner occurred because of the users' insensitivity to lying to a machine, and possibly because of a belief that there were no checks built into the system to uncover their duplicity. Conversely, some automated systems stumble because the users fear that the new system will be used to report on them.

Big computer is watching you

A few years ago, when data entry was still the rage, clerks became terrified when they discovered that key entry systems were programmed to record the keystrokes per minute and the error rate of each typist.

How wonderful, I thought at the time, to track this information accurately. The typists with above-average entry speed and low error rates could be rewarded with higher hourly pay to reflect their efficiency. Poor performers could be moved to jobs that required different skills, or if necessary, be let go for the good of the company.

> ***When data entry was all the rage, systems were programmed to record keystrokes and error rates. How wonderful, I thought. But people do not want to be judged so fairly.***

The point I was missing was that people do not want to be judged so constantly or so fairly. Ask any soldier whether he would rather be inspected by a career sergeant or by a fresh lieutenant who has memorized the book and who sticks by the rules.

The computer, alas, sticks by the rules. While telephone conversations are recorded only by direct human action, the automated office records everything. A communications system should help people look their best and not be used to spy on them.

False friends

On the other hand, users cannot depend on the system to make them look good all the time. Look what an office automation system does for you. You can type your own memo and the spell checker will correct your spelling — but neither will counsel you on the content. Only your secretary can read your memo and tell you that "Mr. Biggley's wife is from Minnesota and she never played football."

The system will deliver your message without fail, time-stamp when the recipient read it and return any reply to you immediately. As a sender, you are encouraged to fire off your first — and perhaps not best — response. As a receiver, you lose excuses such as "I never received it," "We misfiled it" and so on. Sometimes you need more time to consider a point than the questioner wants to give you.

None of this should lead you to believe that the old system was the right way to do things, only to recognize that people know how to perform within it. Something as potentially wonderful and supportive of human effort as a totally automated office deserves some attention to the question of how people can get the most from it. ■

Continued from page 62

illnesses in the future.

• Access to previous employment and arrest records.

• The acquisition of information from companies maintaining data bases on employees' health and lifestyles.

• Video monitoring in restrooms and lounges to check for drug use.

In some situations, the justifications for these are clear. Yet it is important to be aware that there is an expansionary trend toward collecting and accessing personnel information. In a world filled with uncertainty, it is easy to assume that more data is always better. From a privacy as well as an efficiency perspective, that clearly is not the case.

Difficult to protect, easy to lose

Privacy is difficult to protect and easy to lose. MIS and DP managers play a crucial role in protecting privacy and in creating a reasonable balance of interests. If you are convinced that privacy is important and that something needs to be done, you now face some difficult questions.

Who is in charge of privacy in the organization? MIS or DP may, by default, be in charge of privacy, but that is not always evident to anyone in the organization. In fact, this may not be the best place to locate privacy responsibilities, given a conflict with productivity pressures. The definition of explicit privacy responsibilities are required, and adequate resources for maintaining these responsibilities are necessary.

What should and should not be kept private? There are few clear-cut standards that indicate what should be privacy-protected. Some organizations simply use a form of information classification (company secret, company confidential, personnel private and so on) as a shorthand to indicate levels of protection required, but that usually is not an adequate guide. Different standards for data on individuals may require different standards from those for protecting organizational data.

What are the liabilities involved in failing to protect privacy? Liability concerns gain instant attention today. Even with the weakness of the privacy act, there are legal ways to challenge privacy violations. Along with sexual harrassment and civil rights violations, privacy violation cases generate media interest and can have serious implications for corporate as well as individual reputations.

What are the technical difficulties in ensuring privacy protection? Many of these are data base issues having to do with data and system integrity requirements. Integrity constraints must be explicit in data models so that information rules can be defined and maintained. Access rules need to be established and mechanisms put in place to support their operations.

As system linkages further develop, privacy issues will gain increased attention. One way to think about these issues is to develop an organizational privacy protection scorecard. This will provide management with a review of how well privacy is being understood and how much more is required.

View from the public

MIS and DP managers have been assigned key roles in protecting the privacy of the corporation and its employees. Increasingly, these managers will be held publicly responsible in the event that there are major violations.

> ***If protecting privacy is to become standard operating procedure for data processing, explicit policies and procedures are required. It is not sufficient to simply state in an employee handbook that privacy is important. Privacy must be specific to the unique needs of the corporate culture.***

There is increased public concern about individual privacy. Unions, women's groups and civil liberty advocates are raising concerns about corporate and government uses of data. Work monitoring is becoming a symbol for a variety of problems affecting employees on the assembly line and in the office.

Two types of data protection needs are going to have to be addressed. The first is corporate information. This includes certain rights of corporations to be protected from their competitors.

Protecting proprietary information is a leading example. Competitive business intelligence is a growing field, providing firms with tools and techniques to learn about their rivals. Government law enforcement emphasis on financial manipulations has also created new worries for many businesses.

The second kind of data protection to be addressed is employee and customer/client privacy rights. From a corporate perspective, this may be considered a less pressing issue than corporate information protection. However, a lack of attention to employee and customer/client privacy concerns may result in the loss of competitive edge, public reputation and product acceptability.

Consider whether your company is adequately protecting human resource files, creating information flow constraints, limiting browsing through client files, restricting updating capabilities and isolating critical data. More specifically, several activities should be undertaken to guarantee both of these data protection needs. These activities should be integrated into an overall information resource management program under which privacy becomes an essential aspect of corporate policy.

• Make security and privacy standard operating procedures for data processing. Computer and telecommunications security continues to be treated as a voluntary activity in many corporations. Yet laws, professional guidelines, insurance requirements and similar pressures stand to make corporate information security mandatory rather than voluntary. Most organizations soon will have no choice but to secure their data resources.

In the same fashion, privacy is going to become a highly charged public issue again, and corporations as well as government will be examined quite closely. Already, Congress is considering questions about privacy protection, and there are indications that additional privacy legislation will be introduced.

• Establish a privacy protection policy and a set of standards. If protecting privacy is to become standard operating procedure for data processing, explicit policies and procedures are required. It is not sufficient to simply state in an employee handbook that privacy is important. Privacy must be specific to the unique needs of the corporate culture. Policies and procedures should be individualized to cover the unique needs of end users, their managers, human resource managers and corporate planners.

• Review the privacy implications of technology. A cost-benefit perspective emphasizes the measurement of the most efficient and effective use of technology. However, privacy cannot be measured in the same way and is therefore easy to ignore. Only when a formal mandate to consider privacy is established will privacy be considered in corporate decisions regarding the use of technology.

Corporate policy, for example, can require that a privacy impact statement be written periodically or prior to the installation of major technological changes. These statements would spell out how the privacy of the corporation, its employees and customers could be affected and measures taken to maximize privacy protections.

These privacy impact statements would serve as an audit trail of privacy efforts, providing legal as well as ethical reports for the record. A good starting point for this type of required statement might be to ascertain how privacy can be affected by office automation developments.

• Coordinate MIS/DP management, corporate counsel and data security perspectives and efforts. MIS and DP managers may be held responsible for privacy, but there are many others who have insights and associated concerns. Ask corporate counsel about the legal aspects of privacy and basic standards for protecting the corporation from unnecessary liabilities. Work with data security experts to determine the best ways of using technology to prevent privacy and security problems. Integrate their efforts with other efforts in order to establish a sophisticated program.

Live up to the spirit of the U.S. Constitution, soon celebrating its bicentennial, by undertaking a self-review of how well your organization is doing in protecting privacy. Become a public advocate for privacy.

Consider your role in helping privacy to continue as a basic underpinning of our society. Let's make privacy less of a private and more of a public issue. ■


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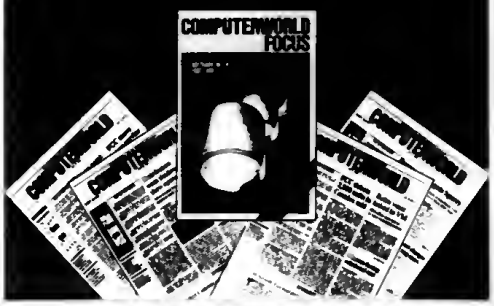
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MANAGEMENT

TAKING CHARGE
Eric K. Clemons

When does DP give the edge?

There has been a recent upsurge in the attention being paid to the strategic potential of information technology. The popular business press has been featuring articles on information power and on electronic distribution systems to keep customers "happy captives."

What does all this mean? Surely much of it is media hype, or self-serving pursuit of a current business fad. Much of it, however, is significant: Information systems can alter a product, can strengthen a firm's position in its marketplace and can radically restructure the entire marketplace by altering relationships with suppliers or customers. What does the director of MIS need to know about this phenomenon? How can your company — and you — benefit?

I begin with a pair of observations and then turn to the conditions necessary for systems to provide a sustainable competitive advantage.

The first observation is from a recent work on competitive strategy by Prof. Michael Porter of the Harvard Business School.

Porter presents three generic strategies. These, he believes, form the basis of any successful, specific business strategy. The strategies are: differentiation, cost leadership and focused niche playing. The differentiation strategy relies on providing superior value. Cost leadership depends upon competing on the basis of price. And niche playing

See **WHEN** page 70

Clemons is associate professor of Decision Sciences at the University of Pennsylvania's Wharton School.

Norton staff goes to CAMP

Off-site computer training program builds awareness

By Eddy Goldberg

WORCESTER, Mass. — The worldwide headquarters of the 101-year-old, $1.2 billion Norton Co. is a sprawling complex with large, smoky, red-brick buildings filled with the dust and noise of men and machinery manufacturing grinding wheels and abrasives products. The contrast between the heavy industry and the quiet, air-conditioned offices of its Information Systems & Services (IS&S) points up one of the problems faced every day by the Corporate Information Center.


Norton's Smith

"We've had a real problem with workers calling us 'the ivory tower,' " concedes Janice M. Smith, supervisor of the Information Center, over the thumping of a packaging machine a few floors below. But she and her coworkers in IS&S have devised an innovative solution to the problem of training factory floor workers as well as vice-presidents to boost their productivity through computer technology: Send them all to CAMP.

CAMP, which stands for Computing, Awareness, Motivation & Perspectives, is an intensive two-day, off-site training program in computing concepts and skills.

The program started a year and a half ago, when Norton's Administrative Services group set up a computer literacy program for 100 people. After meetings between Administrative Services and IS&S, a training program was hammered out. With an outside consultant to lead the CAMP seminars, 121 people from Administrative Services graduated from the CAMP program in its first year.

It has been so well received, Smith says, that other divisions have requested training, and IS&S has begun offering CAMP programs on its own. There have been three this year, and four more are planned. Each CAMP is different and evolves out of the needs of the specific group attending Average class size is 20 to 24

Through the program, workers learn what IS&S has to offer them, according to Smith. "CAMP is a communications and

See **NORTON** page 70

Cigna farms out policy DP work

By David Bright

LOS ANGELES — In what one analyst terms a revolutionary move, Cigna Corp. of Philadelphia has contracted with a Los Angeles service bureau to provide complete data processing for a new life insurance program.

Under a multiyear contract valued at a minimum of $1.5 million, Cybertek Computer Products, Inc. is to integrate personal computers with mainframes for Cigna's venture into the group universal life insurance market.

The agreement calls for Cybertek to provide data processing intended to speed both the sales and administration of policies. Cigna's agents are to use personal computers to prepare custom policies for clients. The micros will tie in with Cybertek's IBM mainframes where the policies are to be be screened and issued by Cypros/AP, Cybertek's real-time insurance processing system.

While some insurance companies hire outside vendors to do data processing, this is the first time one has delegated total facilities management for a product to a vendor, said investment analyst Mary Barrett of Barrett & Co. of Yardley, Pa.

"The revolutionary thing about this sale to Cigna is that Cybertek is essentially providing the administration and marketing support for this one product," Barrett said. "Never before has a company such as Cybertek taken over the total management of a product for a company."

By contracting out the work instead of

See **CIGNA** page 67

INSIDE

INSTANT ANALYSIS

"Information services people are fairly cautious. Deep down they'd prefer to stick to their already-full plate, rather than reach for a broader charter."

— George Hairston, president, AI Services Co., New Haven, Conn., on information systems managers' reluctance to develop artificial intelligence

"In recruitment, the bottom line is results–and that's what you get from Computerworld."

Janet Thompson
Management Supervisor
Bozell Jacobs
Kenyon & Eckhardt Inc

For over 10 years, Computerworld has been a primary recommendation of Janet Thompson, Management Supervisor for Bozell, Jacobs, Kenyon & Eckhardt, when it comes to recruiting data processing professionals. How did such a long relationship evolve?

"Computerworld has proven itself to be the leader in terms of quality response and value for our clients' advertising dollar. In recruitment, the bottom line is results and that's what you get from Computerworld," according to Janet.

"In a tradebook campaign for systems professionals, Computerworld outpulled the other books four to one. We're not only talking quantity, but also quality and the most hires." Janet continued. *"One of our key accounts traditionally uses newsprint. But they make an exception when it comes to the data processing field. They use Computerworld on a regular basis because of its excellent cost-per-hire results."*

The recruitment staff of Bozell, Jacobs, Kenyon & Eckhardt has over 65 years experience in recruitment advertising. And they all share Janet's feeling. *"It's unanimous here. Computerworld is recognized as an essential medium for recruiting in the data processing arena. And it will continue to be a primary recommendation in the future."*

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A PUBLICATION OF CW COMMUNICATIONS

Cigna farms out DP work

From page 65

handling it in-house, Cigna stands to realize substantial cost and time savings, analysts said.

Analyzing vendors' hardware and software and bringing the systems in-house could take several months or even years, whereas Cybertek's implementation is expected to take only three months, according to sources close to the company.

By turning to Cybertek, Cigna also lessens its financial commitment while gaining use of current technology, analysts said.

Cigna, which is in a labor-intensive industry facing a shrinking pool of workers, can also cut labor costs by farming out data processing, said David Butterworth, an analyst with Wedbush, Noble, Cooke, Inc. of Los Angeles.

Generating further savings, Cybertek will issue certificates instead of bulky policies, also a departure from the norm, Barrett said.

Cigna officials declined comment until the system is fully operational.

Cybertek has provided services and products to the insurance and finance industries for 17 years. Its integration of personal computers and mainframes for processing the sale and administration of insurance policies is a first, said Forest Majors, Cybertek's senior vice-president of sales and marketing.

Compaq Computer Corp. portable computers will be used in the project, sources said.

CALENDAR

AUGUST 3-9

Contemporary Data Communication Networks: Planning, Management and Computer-Based Design. Ann Arbor, Mich., August 4-8 — Contact: Engineering Summer Conferences, 300 Chrysler Center/N. Campus, Ann Arbor, Mich. 48109.

Topics in Manufacturing Systems Engineering. Fort Collins, Colo., August 4-8 — Contact: National Technological University, P.O. Box 700, 601 S. Howes St., Fort Collins, Colo. 80522.

Data Communications: Fundamentals and Beyond. Anchorage, Alaska, August 6-8 — Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940.

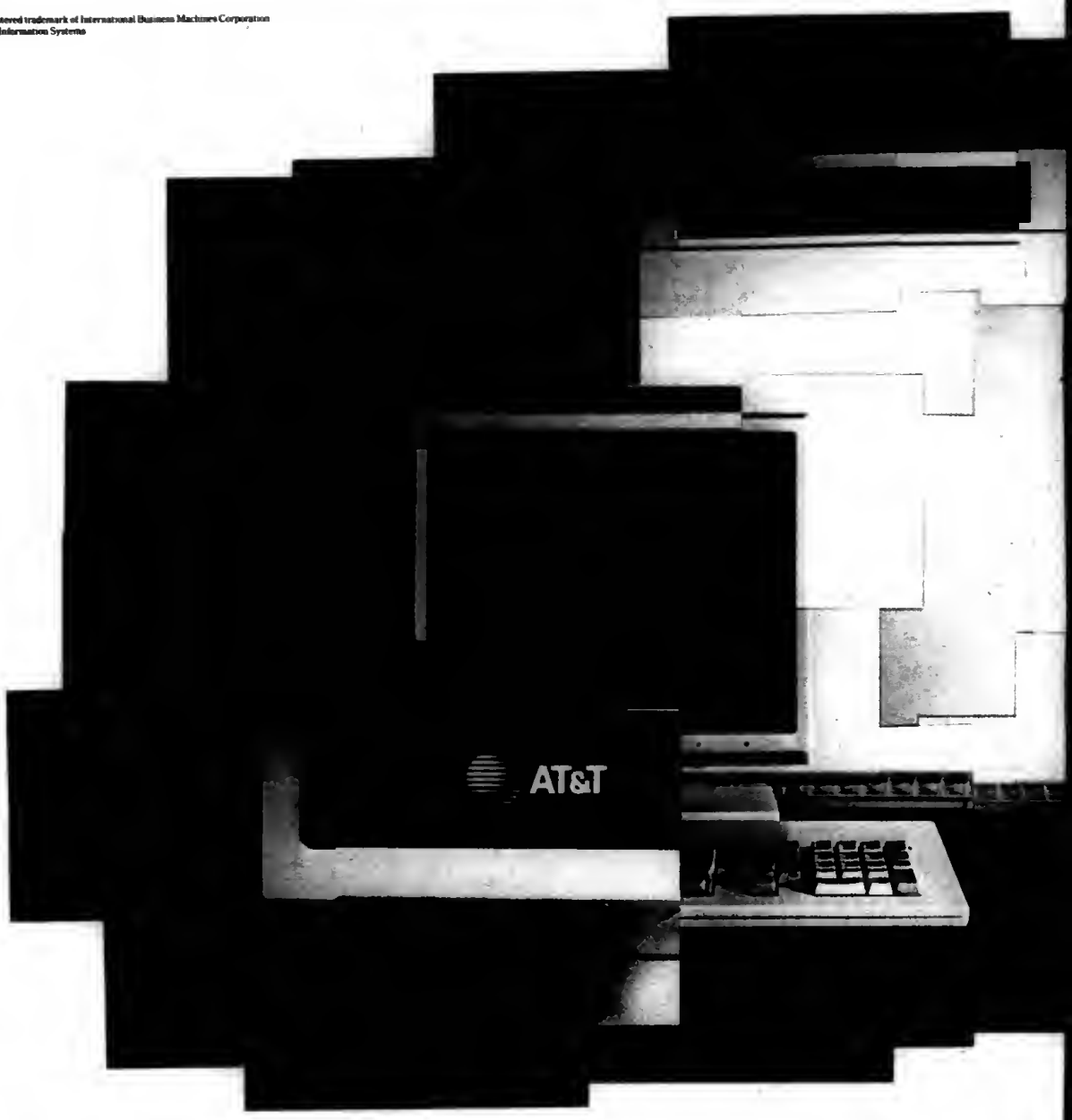
1986 Urban & Regional Information Systems Association (URISA) Conference. Denver, August 9-14 — Contact: URISA, 319 C St. S.E., Washington, D.C. 20003.

AUGUST 10-16

AM/FM International Ninth Annual Conference. Snowmass, Colo., August 11-14 — Contact: AM/FM International, Suite 820, 8775 E. Orchard Road, Englewood, Colo. 80111.

AAAI-86 Fifth National Conference on Artificial Intelligence. Philadelphia, August 11-15 — Contact: The American Association for Artificial Intelligence, 445 Burgess Drive, Menlo Park, Calif. 94025.

Buying and Selling Rights to Software, Hardware and Services. Atlanta, August 14 — Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.



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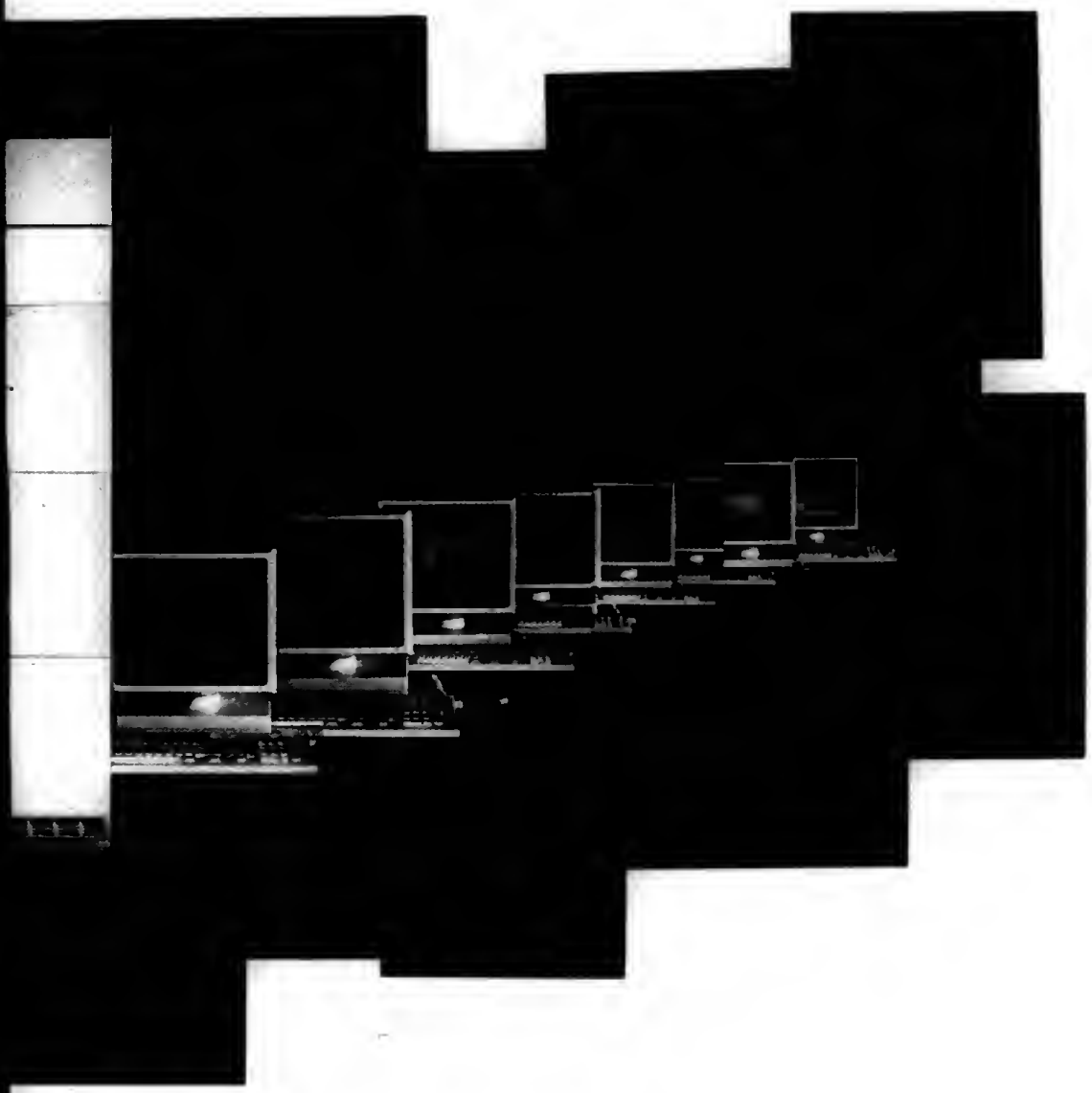

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Norton staff goes to CAMP

From page 65

awareness vehicle that allows us to know many users, and, more important, it allows them to know us — who to call for help, who to go to for consulting and technical assistance and what training classes we provide. While this is an education class for them, it's also a way for them to get to know who we are and to come back to us," she explains.

The first day is usually devoted to personal computers and the second to learning about the tools available on the company's mainframe. Attendees use about 10 PCs hooked to the mainframe over phone lines to allow practice on the mainframe tools.

Group activities such as volleyball, an evening cookout and the option of sleeping over at the mansion where the CAMP program is held contribute to the relaxed atmosphere and team spirit, Smith says. "It's team building," she adds.


Gaudette

Fred Gibb, a project administrator in Administrative Services who attended CAMP in May, says holding CAMP in an informal, off-site location is a good idea. "It takes people out of the work environment, from demands that cause their minds to go back to the job, so they can concentrate on the experience of learning," he says.

While the CAMP program was originally conducted over three days, it has been reduced to two. "What we're really up against is the fact that people want to do more than they did yesterday but want just to be quickly shown how to do it and get on to doing it," says Edward F. Gaudette, manager of end-user computing and office automation in IS&S.

Training factory floor workers who may never have touched a keyboard to use computer technology poses unique challenges. "That's a tough thing for them. They think they're going to lose production when they have to stop to key something in," says Kris Barr, a data analyst for one of Norton's plants. "But you have to get that change in thinking."

The idea of sitting in a classroom can intimidate people who never graduated from high school or who last attended school 20 years ago, Smith says. Carol Williams, a plant training coordinator and facilitator, says that many new trainees are afraid of the unknown, of the threat computers represent. She says people immediately wonder, " 'Is it going to take over my job?' People have that feeling about robots, too," she adds.

Yet workers often push for computer training. Smith says that when a department superviser resisted suggestions that automating a factory floor would boost productivity, the workers who found out about the idea continued to push for it.

"I think a lot of times the technology is embraced by the worker first and then brought up level by level," Smith says. "It's seldom that technology comes in from the top, at least not in our experience. That's why it's so valuable to get people into the classes."

Smith also says she believes that bringing management into the CAMP program is a good idea, if only to show the factory workers that computers can be intimidating to management as well. "If higher management would come into some of these classes and risk being human, they would gain a lot," Smith says.

IS&S still faces training problems with employees who have been through CAMP, Gaudette says. "How do you get people beyond the simple, the easy, the friendly so that they utilize the applications that they're running to their fullest and thus improve their productivity?" he asks.

There are many more employees to train, particularly with the company automating production and order information as part of a major shop-floor control project. Nevertheless, Smith is undaunted. "My goal in life is to educate everybody at Norton," she smiles.

When can DP give the edge?

From page 65

depends on finding a small specialty market in which to operate.

The other observation is that not all innovative uses of information technology have equal rates of success.

All major metropolitan banks now offer automatic teller machines but few, if any, can point to real cost reductions or market share advantage resulting from the ATMs' introduction.

Electronic home banking and videotex shopping in the U.S. have been disastrously unprofitable, at least in the short run, for all who have attempted to popularize them.

Now, how can we characterize promising uses of information technology?

First, we make a distinction between internally focused and externally focused applications. Internally focused systems are generally used within a firm for cost reductions or quality improvement; they do not have an interface with suppliers, customers or the outside world. Externally focused systems, by contrast, are used principally by customers, clients or suppliers and are

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Downsizing DP

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Savings in response time and communication line costs are two advantages realized by Cox Cable Communications' largest system — some 270,000 subscribers — in San Diego. That system went on-line with a Tandem TXP in June and receives its support and programming from Cable Data of Sacramento, Calif., its Tandem supplier.

"From a staff point of view, the system has created some jobs here, and everyone is fairly positive," Bill Robinson, DP manager says.

Robinson reported "no problems out of the ordinary" with the conversion. "For 2½ weeks we were not on any system, so we had a lot of catching up to do. And the new release of some application software is taking some time to debug. We're using entirely different software now, which in some ways is an improvement, and in others it isn't. It's just a totally different system, and it will take some time to get used to it."

The bottom line for Prater is to improve efficiency, data integrity and savings on operating costs. The conversion program, which began in late 1984 and is to be completed by first-quarter 1987, was designed to provide each cable system with the autonomy and flexibility needed to better serve its customers. "We wanted to instill within each system an entrepreneurial spirit," Prater explains.

In September 1985, Cox Communications, Inc., with broadcasting, cable and auto auction subsidiaries, merged with Cox Enterprises, Inc., which owns a chain of newspapers, including the *Atlanta Journal and Constitution*. The new company, Cox Enterprises, is privately held with newspapers, cable television, auto auction and broadcasting as subsidiaries.

After the merger, it was decided that Cox Enterprises would decentralize many of the decision-making processes and responsibilities of each division from headquarters to field offices. The cable DP conversion project had already begun when the merger was announced, so Prater's philosophy seemed a perfect fit.

The minicomputer market has become much more competitive than the mainframe market, resulting in improved minicomputer price/performance, which is attractive to companies that could use either type of system. As a result, some DP shops are beginning to downsize from mainframes to multiple minicomputer environments, and more are likely to join the ranks within the next few years, according to Frank Gens, vice-president of IBM services at Internatinnal Data Corp., a Framingham, Mass.-based market research firm.

"You can't expect the lion's share of IBM mainframe users to start replacing them with networks of minis, but those customers at the entry point of a mainframe are going to be looking more and more at multiple networked minicomputers as an option," Gens says.

By discontinuing the use of the 3081, along with an Amdahl Corp. 470V/7B used mainly for statistical analysis applications, there was no need to maintain a large support staff, Prater says. Although each cable system has hired from one to three DP staff members of its own, they will rely mainly upon turnkey vendors for installation, training, programming, support and maintenance.

Management at each remote site has inherited duties formerly performed by the DP staff at headquarters. "There was an absorption of function by general managers, customer service managers, collection managers and administrative managers who would collectively take over the equivalent of a DP manager in the home office," Prater says.

There have been considerable savings in operating costs as well as in personnel, but they are intangible and difficult to tabulate, Prater says. "We're saving some funny money, if you will, in the sense that we had a corporate DP department that took up over 20,000 square feet along with a large staff. That's a lot of overhead when you compare that, today, we are down to 5,000 square feet. And the field offices always have some little nook or cranny to put a small machine, so there's no increase needed there."

Other savings have been realized on software and communications costs, Prater adds. "The software on the new machines is basically purchased, so when you take that cost and compare it to the ongoing rental of mainframe software, the savings are tremendous. The savings with running a network was the most dramatic. But the real savings, altogether, are the intangibles — improvements from customer service, more flexibility and satisfaction all around."

Previously, remote sites were connected to headquarters with a combination of broadband coaxial cable local-area networks (LAN), network controllers, modems and satellites. All files and data bases were housed on the 3081, and each site had to download for the purposes of billing and preparing financial reports, in an interactive environment.

This created a "tremendous volume of traffic," according to Prater. With the new system, each site has its own data base and uploads a summary of its financial reports and billing on a weekly and monthly basis.

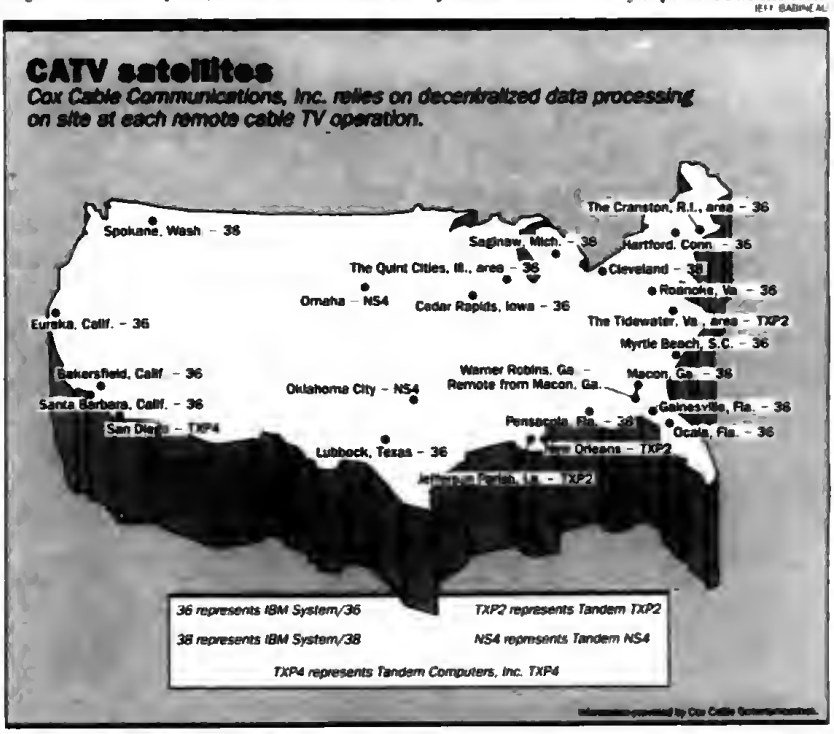
Under the system, LANs at remote sites tie together the terminals with a standalone CPU at the terminals' own sites. In turn, each LAN is connected to a national IBM Synchronous Data Link Control point-to-point and multidrop network that is controlled in Atlanta.

Prater's plan sounds interesting to Reubeo Villanueva, director of computer services for American Television and Communications, Inc. (ATC), which operates 100 Cablevision systems throughout the country. But security and additional operating expenses would be major concerns for Denver-based ATC in such an environment.

"It sounds like he has created a lot of powerful nodes, and none of us has a real big travel budget, so I don't know how they would go about enforcing security or disaster recovery," Villanueva says. "Security is an important issue with billing systems, which means revenues, and you almost need a centralized effort to control it."

Prater agrees that, in theory, the system has a greater potential for security and disaster risks, but he adds, "We've actually seen an improvement in security, and we think the new system has solved a lot of disaster recovery problems."

A security administrator has been appointed at each site to maintain local passwords and controls, and additional security measures have been installed at division headquarters, he says. In addition, off-site locations for storage and tape cycling have been established for each site in the event of disaster. Data backup is performed daily.



Not without problems

The switch from a large mainframe shop to a smaller mini-based operation was not without its management problems. To implement the conversion of both software and hardware, Cox Cable Communications looked to Information Systems Development (ISD) of Coral Springs, Fla., which markets turnkey solutions for IBM systems.

But the financial and billing applications software offered by ISD did not address many of the requirements previously met by the applications developed by Cox Cable Communications programmers.

"The package had to be elaborately redeveloped to suit our needs," Prater says. "At that time, I had a staff of CICS and Cobol programmers who didn't relish the idea of stepping back to System/36 programming.

"So, I had to go out and hire some System/36 and 38 specialists, but they didn't know the cable industry or the applications. Meanwhile, they coexisted with the long-term people, who could see the end was coming. Finally, we decided it just wouldn't work, that programmers are very expensive and the technology changes too fast.

"We decided: Why not get rid of all the programmers and rely on the vendors to do the programming we need? We retained five senior development types to coordinate with the vendor developers, so when I need something from ISD, I have a key person that has been here for 17 years and can tell them what we want."

There are drawbacks to the new system, Prater admits. Cox Cable Communications now has a significant investment in System/36, 38 and TXP technology and in programming and support from both ISD and Cable Data. He says, "If these vendors don't supply the functional requirements I need in the future, what do I do? And the technology we have invested in could become obsolete virtually overnight. But these companies want our business, and they will generally respond to what we want, although maybe not in as timely a fashion as we would like."

By operating its own System/38 with support from

See **DOWNSIZING** page 73

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When can DP give the edge?

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intended to add value.

Of the two, externally focused applications have received most of the recent press coverage. By their very nature, they are visible, and when they work, they are dramatic. Successful innovations here are characterized by the following:

- There is real benefit to the customer — value added — to bring him in.
- There is real benefit to the firm — growth in market share, increasing profit margins — consistent with the firm's strategy.
- There is time for the innovator to harvest the benefits before competitors' actions erode gains from the new system.

This last point is quite important, since, if there were no way to defend the resulting gains, the information systems innovation would change the cost structure of the industry but would not prove to be strategic.

Most of the successful applications that have been reported have relied upon customers' switching costs to defend gains. A travel agency changing its reservation system or a retail pharmacy changing its supplier write off their training and experience. Data files, maintained as account histories, may also be lost. When customers' adoption is rapid and switching costs significant, the initial developer may enjoy real first-mover effects.

By definition, internally focused systems do not offer the possibility of customer switching costs to defend gains. When then can we expect such a system to prove strategic?

Again, we require that the system provide benefits to the firm, consistent with the firm's strategy. And again we require time to harvest these benefits. In this case, though, time is likely to be provided by barriers that prevent competitors from duplicating the application. They could be a size advantage that makes the application unfeasible for a smaller competitor, superior skills in information systems development or a management willing to innovate and change organizational structure to exploit innovation.

A final note: If an information systems innovation is likely to develop into a commodity and this development is recognized sufficiently early, there may still be considerable value in being the provider of that commodity. An example is a bank that seeks competitive advantage by serving as a service bureau for banks too small to process their own ATM transactions.

Downsizing DP

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ISD, Macon, Ga.-based Cox Cable Communications' system has experienced a sizeable decrease in downtime and a higher data integrity, according to Vikki Jordan, DP coordinator. But software problems and the long hours involved in running a computer system have made the new system something of a toss-up in the popularity polls.

"Most people favor this system as far as the hardware and the increased uptime are concerned," Jordan says. "But as far as the software, there are a lot of problems with the new billing package that sometimes makes us wish we could go back to the old system."

Overall, Prater says he believes the cable division had no other feasible choice than to shrink from a mainframe to a mini. "To downsize a well-oiled machine and a department with 155 long-term, competent employees is . . . well, a lot of people won't bite that bullet, and they should," he says.

"There is an awful lot of flexible, canned software out there, and I think, as a result, in-house programming as we know it today could be passe. The money spent on developing, when compared to what's already available, is surprising. Programmers are often status symbols for a company, to show how big they are. So I suppose what we are doing is unorthodox from that standpoint.

"You have to get out of the DP mode and be a businessman once in a while, but many DP people will not cross that bridge."

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NEW PRODUCTS

Software to analyze PC disk drives

Xidex Corp. of Santa Clara, Calif., has announced its diagnostic software package called the Investigator. The software is said to allow personal computer users to test the performance of their fiexible disk drives.

The Investigator works by prompting the user through a setup procedure. Once the user has done his part, the Investigator then performs seven tests of the disk drive in approximately one minute, a company spokesperson said. Users receive a pass/fail report, or they can command a more detailed analysis with exact numerical results by pushing two command keys.

The comprehensive test profile checks the following: read-and-write accuracy, spindle speed, static head alignment, timing of the index to data, azimuth head rotation, dynamic head alignment and disk centering. A printout of the results can be produced after the user inputs a specific command.

The Investigator drive performance analyzer is said to be relatively easy to use and offers more precise analysis than comparable diagnostic tools. The Investigator costs $34.95.

The drive performance analyzer reportedly can test the flexible drives of more than 20 IBM Personal Computers and compatibles. The Investigator, said to be based on the same technology as the Dysan Corp. Interrogator, is a sophisticated disk drive test package that includes two diskettes, combining both the program and test tracks on one diskette.

According to the Xidex spokesperson, instead of waiting until a disk drive fails, the Investigator allows PC users to spot problems before they get worse and damage valuable software data. The Investigator also helps users decide if the problem is with the diskette or the drive as well as allowing users to check that their drive is getting proper service, the spokesperson added. If the problem is in the drive, a user will be able to pinpoint the problem for a service technician.

Xidex Corp. manufactures a range of flexible disk drive alignment and diagnostic test products. These include the Analog Alignment Diskette, the Digital Diagnostic Diskette and the Performance and Alignment Test.

HP rolls out quiet printer

Intended for graphics, spreadsheet generation

The Quietjet Plus inkjet printer is the latest printer to be introduced by Hewlett-Packard Co., based in Palo Alto, Calif.

The wide-carriage unit, featuring quiet operation and near-letter-quality printing, is said to be designed for users who perform business applications from word processing to graphics and spreadsheet generation.

HP's Quietjet Plus inkjet printer

The Quietjet Plus, priced at $799, offers two print qualities and flexible, user-convenient, paper-handling features, according to the vendor. It handles tractor-fed and cut-sheet paper in widths from 5 in. to 15 in., for labels, memos, letters and spreadsheets. Quietjet Plus also has a paper advance knob and a true platen, enabling the user to insert and retrieve cut-sheet paper.

The printer offers three print speeds: 40 char./sec. for near-letter-quality output, such as letters and reports, 160 char./sec 10-pitch printing and 192 char./sec. 12-pitch printing for draft-quality output including memos, first drafts and listings. Common functions such as underline, bold, subscript and superscript are standard.

The Quietjet Plus supports three different graphics resolutions including 96 by 96 dot/in., 192 by 96 dot/in. and 192 by 192 dot/in. Fonts and special characters can be downloaded from host computers or optional random-access memory or read-only memory can be added to support other customized needs.

The printer features both the RS-232-C serial and parallel I/O interfaces and supports most popular personal computers such as IBM Personal Computers and compatibles as well as the Apple Computer, Inc. Apple II series and Macintosh computers. HP terminals are also supported.

The Quietjet Plus supports a host of software including Lotus Development Corp. 1-2-3 and Micropro International Corp. Wordstar. Other general business software for general ledger, accounts payable and receivable and payroll applications that require wide carriage printing are also supported.

According to the vendor, inkjet technology, whereby characters are formed on paper by spraying ink through tiny holes in the printhead, is responsible for the quiet 48db operation of the Quietjet Plus, compared with 58db to 62db for regular dot-matrix printers

According to HP, Jetseries supplies for the Quietjet Plus printer are available including 8½-in. by 11 in. and A-4-size paper, wide spreadsheet paper, mail labels and black, blue, red and green single-color ink cartridges.

Tool makes two PCs act as one

Norton-Lambert Corp. of Santa Barbara, Calif., has introduced a remote software package called Close-Up for use with the IBM Personal Computer, Personal Computer AT, XT and compatibles.

According to the vendor, Close-Up is a remote communications system that allows two computers in different locations to operate simultaneously as if they were one computer, leaving the host computer free to operate normaliy. Close-Up allows full control and viewing of each computer from the other. Computers, screens and keyboards are linked as one.

Close-Up is said to include such features as remote printing, graphics support, error protection, a movable chart window that allows users to carry on a dialog whenever there is a need to communicate as well as time and billing capabilities.

Close-Up is able to save a specific session by taking snapshots of the individual screen and storing them for later recall.

Close-Up works with Lotus Development Corp.'s Symphony and 1-2-3, Ashton-Tate's Dbase III Plus and word processing programs.

There are two sides to the Close-Up system: Close-Up Support costs $245; Close-Up Customer costs $195.

Speed not sacrificed to windowing in emulation package

Asher Technologies, Inc., the communications product division of the Quadram Corp., has announced an IBM Personal Computer-to-minicomputer emulation package designed around the 16-bit Motoroia, Inc. M68000 microprocessor and said to offer the ability to run seven concurrent sessions.

With the Motorola chip built into the emulation board for the IBM System/34, 36 and 38, the Asher Minilink reportedly enables windowing of seven concurrent sessions without sacrificing speed.

Users are able to print documents, transfer files and run minicomputer programs simultaneously.

Windowed sessions can also be cut and pasted into different windows.

Menu-driven interface

The emulation software is said to offer a menu-driven interface with easy-to-use features.

The Asher Minilink package consists of a board that emulates and addresses IBM 5251-11, 5291 and 5292-1 display terminals for the IBM System/34, 36, 38 minicomputer series, along with emulation, concurrent file transfer software packages and coaxial cable connections.

The package, available now, is priced at $895.

Can be used as LAN gateway

With a software upgrade, the Minilink can be used as a gateway to the majority of standard local-area-networks (LAN), according to Charles Copeland, manager of software engineering and support.

A single Minilink board installed inside a microcomputer can simultaneously connect up to seven micros to one minicomputer.

The upgrade, available for $1,395, supports Quadram's Quadnet VI and IX LANs, which are based on the Novell, Inc. 2.0A communications software that provides an interface to IBM's Token-Ring and PC Networks, among others.

The demand for multifunction PCs that can access the host minicomputer is growing rapidly, claimed a company spokesman.

The Minilink was designed to provide the flexibility of a multifunction workstation by allowing the PC user to access the host minicomputer while retaining standard PC functions, he added.

INSIDE

SOFTWARE & SERVICES

Systems software

Treehouse Software, Inc. has announced **Trim Version 3.0**, a release of its Software AG of North America, Inc. Adabas/Natural performance monitor.

Trim Version 3.0 includes an enhanced real-time monitor with extensive Adabas session statistics, queue information and worst-user trapping. It can suppress inefficient commands and perform security checks.

Trim Version 3.0 for OS/VS1, MVS and VM sites costs $12,000, and DOS/VSE is priced at $10,500.

Treehouse Software, 603 Beaver St., Sewickley, Pa. 15143.

■

Program Accountability & Evaluation, Inc. has upgraded its **Librarian/38** software for IBM System/38 computers.

Librarian/38 includes a command processing management system that allows users to manage any commands available to them. Parameters can be predefined for a command and then loaded into a file. The tape and diskette data base and spool file management system have been updated, and label printing is available.

Librarian/38 costs $1,055.

Program Accountability & Evaluation, 7 Riverway Road, Salem, Mass. 01970.

Applications packages

Soft Pro Systems has introduced **Project Management System** and **Mailing List Management System**, software products for Wang Laboratories, Inc.'s VS computer.

The Project Management System features include online task maintenance and project schedule report by work day.

The Mailing List Management System can sort, select, match and combine any fields and lists in the data base to produce output or create new lists.

Project Management System costs $7,000, and the Mailing List Management System is priced from $10,000.

Soft Pro, 3718 MacDonald Ave., Richmond, Calif. 94805.

Utilities

Interlink Computer Sciences, Inc. has introduced a **VT100/220 and 3278 terminal emulation** package as an option to its 3711 and 3711S Gateway.

With VT100/220 emulation, an IBM 3278 terminal user can log on to a Digital Equipment Corp. VAX system or RSX system, accessing most applications in full-screen mode.

With the 3278 option, a DEC VT100/220 terminal user can connect to Systems Network Architecture applications in the IBM mainframe environment.

The VT100/220 and 3278 full-screen terminal emulation package costs $9,950 for single-direction access and $14,950 for bidirectional access.

Interlink Computer, 39055 Hastings St., Fremont, Calif. 94538.

■

Mentor Graphics Corp. has introduced **Development Station**, a workstation-based set of development tools.

The Development Station is said to allow users to build and maintain applications on the Mentor Graphics Compute Engine global accelerator. Tools included are C, Fortran and Pascal optimizing compilers; a linker; a symbolic debugger; and two librarians.

One librarian is used to organize and maintain related groups of compiled modules, and the other librarian organizes and maintains execution-time dynamic binding environments.

Available in October, Development Station prices start at $29,900.

Mentor Graphics, 8500 S.W. Creekside Place, Beaverton, Ore. 97005.

MICROS

Systems

Tasvir Corp. has recently enhanced its **Personal Supercads**, which is a personal computer-based mechanical computer-aided design system.

Some enhancements include increased speed; crossview geometry manipulation that allows simultaneous access of up to 16 on-screen

three-dimensional model views for design modification. The ability to simultaneously highlight, in all views, geometry segments identified for design modification and the ability to instantaneously update 11 views on the screen as changes are made to the 3-D model are also included.

Personal Supercads costs $18,900 for a 13-in. monitor and software kit.

Tasvir, 1091 Stierlin Road, Mountain View, Calif. 94043.

Software applications packages

West End Film, Inc. has released its **CAD2ART** Autocad-to-Artwork conversion package for IBM Personal Computers and compatible machines.

According to the vendor, CAD2ART allows users of Autodesk, Inc.'s Autocad program to bring drawings into Artwork for further editing and rendering.

According to the vendor, CAD2ART also provides access to many of the 4,000-line film recorders and laser and thermal printers that Artwork supports. CAD-2ART is also said to convert the DXF files saved by Autocad into CEL files so Artwork can read them.

The CAD2ART software costs from $750 to $2,500, depending on the color card and package involved.

West End Film, 1825 Q St. N.W., Washington, D.C., 20009

Software utilities

Addison-Wesley Publishing Co. has introduced **DVI Laser/HP**, a software utility said to enable Hewlett-Packard Co.'s Laserjet Plus to print text produced with Addison-Wesley's Microtex personal typesetting software

DVI Laser/HP works by translating Microtex files into a language understood by the Laserjet Plus. Microtex is a typesetting program that gives the user complete control over how a document will look, from the size and spacing of the letters to the page layout.

DVI Laser/HP costs $250.

Addison-Wesley, Reading, Mass. 01867.

Software enhancements

Digital Communications Associates, Inc. has improved its **Smart Alec** emulation software.

Said to be compatible with IBM's Application Program Interface, Smart Alec enables the user to run host software programs such as PC Support 36. It now also supports IBM's Enhanced Graphics Adapter and permits an IBM PC to run seven host sessions simultaneously.

The Smart Alec add-on board with Version 1.03 of the software costs $895 including the basic file transfer software. Enhanced File Transfer costs $1,295.

Digital Communciations Associates, 1000 Alderman Drive, Alpharetta, Ga. 30201.

Communications

Hayes Microcomputer Products, Inc. has released **Smartcom II V2.2** for the Apple Computer, Inc Macintosh.

Smartcom II V2.2 supports the Macintosh Plus hard disk hierarchical file system. It is also compatible with earlier versions of the Macintosh. It now supports Macintosh hard disk subdirectories, so users can get subdirectory files to transmit over a modem.

Smartcom supports data transfer rates ranging from 300 bit/sec. to 19.2K bit/sec. It works with Hayes and compatible modems and costs $149.

Hayes Microcomputer Products, 705 Westech Drive, Norcross, Ga. 30092.

COMMUNICATIONS

Software

Software Results Corp. has introduced its **400 series** of **Comboard** front-end communications processors for Digital Equipment Corp. Unibus computers.

The 400 series hardware and software package was designed to provide DEC-to-IBM mainframe communications at speeds of up to 4.8K bit/sec.

The series is available for Houston Automatic Spooling Program (HASP), 3780 and Systems Network Architecture (SNA) remote job entry protocols. It features intelligent Motorola, Inc. 6800-based hardware.

The 400 series is priced at $6,500 for HASP and the 3780 and $8,000 for SNA.

Software Results, 2887 Silver Drive, Columbus, Ohio 43211.

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Diablo is a registered trademark of Xerox Corporation.

Tycho Research Associates, Inc. has announced **Tycho/Haspnet** and **Tycho/Hasp** communications software.

Tycho/Haspnet reportedly supports communications between all Digital Equipment Corp. VAX/VMS nodes in a Decnet network and one or more IBM mainframes. Tycho/Hasp is said to enable VAX/VMS systems to support a shareable remote batch job entry data link to an IBM mainframe.

According to the vendor, Tycho/Hasp is also supported on Microvax II under the MicroVMS operating system.

Tycho/Haspnet communications software costs from $3,000, and Tycho/Hasp costs $4,500.

Tycho Research Associates, 995 Waterloo St., London, Oot. Canada N6A 3X4

SYSTEMS & PERIPHERALS

Data storage

Emulex Corp. has introduced the **MD23** and the **MD24** disk controllers, designed to connect up to four 5¼-in. Winchester disks that have an enhanced small disk interface (ESDI) to the small computer system interface bus.

With the MD23, the single-end model, the controller and the host can be placed up to 20 ft apart. With the MD24, the differential version, the controller and host can be up to 80 ft apart.

Both disk controllers feature the ESDI drive interfaces with disk transfers up to 15M bit/sec.

The MD23 costs $435, and the MD24 costs $515.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

Terminals

Perfect Terminal, Inc. has introduced **P411**, an emulation of Data General Corp.'s D410 and D411 terminals.

The P411 terminal features horizontal scrolling and windowing capabilities. The horizontal scrolling feature is said to give users the opportunity to view 162-char. lines on its 14-in. green or amber screen.

The P411 also has a total of 38 programmable function keys. The P411 offers an optional 20 mA current loop communications interface.

The P411 is priced at $795.

Perfect Terminal, 3319 Seldon Court, Fremont, Calif. 94538.

Printers/Plotters

Roland DG has announced **CAMM-3**, a three-dimensional plotter for use with computer-aided design and manufacturing systems.

The plotter is said to allow users to try out ideas in 3-D form with the same data and programs used for drawing plans on an X-Y plotter.

According to the vendor, the CAMM-3 features three-axis simultaneous movement, .00039-in. resolution, adjustable spindle speed and feed rate and the ability to use manual or computer control.

CAMM-3 works in a variety of materials such as aluminum, brass, wood, plastics and wax.

The CAMM-3 plotter is priced at $12,995.

Roland DG, 7200 Dominion Circle, Los Angeles, Calif. 90040.

Multiplexers/Modems

Racal-Vadic has introduced the **1200VP**, a 1,200 bit/sec. asynchronous modem.

The 1200VP is said to feature an enhanced set of Racal-Vadic's AT-2Plus dialing commands, eight LED indicators, four function switches and an automatic voice-to-data switching circuit.

The four function switches allow users to select between data or voice mode, high or low speed, manual or autoanswer and analog or digital loopback testing, according to the vendor.

The 1200VP is AT&T 212 and 103 compatible and fits under a standard telephone.

The 1200VP costs $350.

Racal-Vadic, 1525 McCarthy Blvd., Milpitas, Calif. 95035.

■

Telenetics Corp. has introduced **MNP**, a modem error-control module.

According to the vendor, the MNP module utilizes an asynchronous error-correction protocol that upgrades existing stand-alone, dial-up modems.

In its plug-in card version, the MNP module uses the Telenetics 1,200 and 2,400 bit/sec. models.

The module is said to enable data to be transferred error free between a wide range of computers, from low-end microprocessors to large mainframes.

The MNP plug-in module is priced at $100 as a field add-on option.

Telenetics, 895 E. Yorba Linda Blvd., Placentia, Calif. 92670.

Local-area networks

Invisible Software, Inc. has introduced its **Invisible Network** local-area network for use with IBM Personal Computers and compatibles.

The Invisible Network is said to connect up to 45 computers at a maximum distance of 1,300 ft. It performs data transfer at a rate of 700K bit/sec. Each computer in the network has an interface card with an on-board, read-only memory program. The computers are connected with double twisted-pair wire.

Features include compatibility with IBM's Netbios and PC-DOS 3.1 or higher and the ability to run the IBM PC Network program.

Each interface card is priced at $240.95.

Invisible Software, 481 47th Ave., San Francisco, Calif. 94121.

COMPUTER INDUSTRY

Section begins on page 110

American Management Systems rebounds, plays on strength

Narrows focus to large users, vertical markets

By Mitch Betts

ARLINGTON, Va. — American Management Systems, Inc. (AMS), a software and services firm that hit rock bottom five years ago, has managed a dramatic recovery by exploiting its strength in government, financial and academic markets.

By its own admission, AMS ran into trouble by trying to mass market packaged software for minicomputers, a bad move for a firm whose strength had been in consulting and selling software to very large users. "Things started to go south in 1980 and 1981 when we ran into a lot of problems," AMS President and Chief Executive Officer Charles O. Rossotti said in a recent interview. "Our strategy was too unfocused, and we were involved in too many things."

In 1982, management reorganized AMS to focus on combining professional services with packaged software for large users in specific vertical markets. AMS jettisoned its minicomputer-oriented businesses, time-sharing operations and products for small businesses, Rossotti said.

Instead of mass marketing, AMS regrouped so it could concentrate on the vertical markets it already had penetrated. Typical products from AMS are credit management and automated credit application software systems for banks, financial management systems for government installations and administrative systems for colleges and universities.

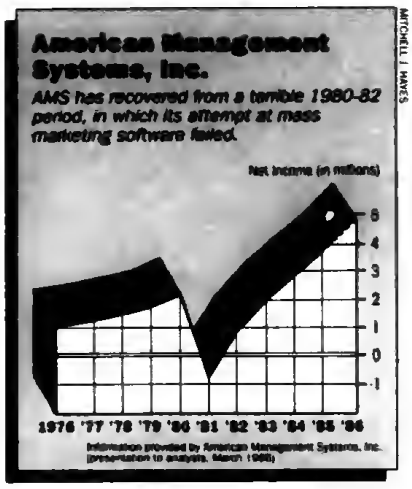
AMS is also starting to penetrate the telecommunications industry, with clients such as MCI Communications Corp. and with a new administrative package for order processing and billing.

"Their focus on applications software products, and building complementary services around those, is a good strategy," said Cato Carpenter, analyst with Alex Brown & Sons, Inc. "They've carved out expertise in some key markets with a market-segment strategy."

Consequently, Carpenter added, AMS is likely to achieve its goal of maintaining revenue growth of 15% to 20% annually.

"AMS has developed very sophisticated software packages that can be modified to meet the needs of specific institutions, so they go in with a complete solution," Carpenter said.

Just a few years ago, the idea of combining packaged software with professional services was considered crazy or unnecessary, CEO Rossotti said. "Now it's becoming an accepted movement, toward software with support services," he said.



MITCHELL HAYES

One part of the firm's strategy is to contract with clients to share in the development of a specific software product. "If you can get a customer to help develop a product, you can be pretty sure there isn't an existing product that comes close to solving their problem," said Patrick W. Gross, chairman of the AMS executive committee.

Rossotti and Gross said their plan for the future is to do more of the same — to expand the product line in AMS's existing niches to solve user problems.

In the federal systems market, the tricky part of this strategy is that AMS must thread its way through changing government policies to win government contracts, which make up about one-third of its business.

On one hand, the White House Office of Management and Budget has ordered federal agencies to make greater use of packaged software to save on in-house development and maintenance costs. "This plays right into our hands," Rossotti said.

On the other hand, federal budget-cutting legislation could stall government computer projects. But AMS executives maintain that even with budget cuts, the federal information technology budget is likely to grow about 11% to more than $15 billion next year. "There will be individual nicks here and there. . . . but that's still an awful lot of money," Rossotti said.

EXPECTATIONS

The new ADDS 2020 will raise your expectations about all display terminals. You've always expected readable data. Now you can have high resolution, larger characters, 80/132 columns, 14" green, amber or white display, line graphics for highlighting, and variable-speed smooth scroll. There is, however, one thing you should not expect from the 2020—screen flicker. A unique 70Hz refresh produces a flicker-free display that you can read all day.

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Greater expectations: The 2020 provides Lotus*-like menu bar assistance for function keys and applications; available desk accessories include a clock, calendar, calculator and tele-communications; a printer port for either serial or lower-cost parallel printers; and bell volume programmable from the keyboard or host. And, as superior as this new terminal is, it is still fully compatible with ADDS, Hazeltine, Lear Siegler, TeleVideo, Wyse and many other terminals.

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ADDS

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*Lotus is a registered trademark of Lotus Development Corporation.

Sperry director reassures UK users about Burroughs merger

Chairman's visit boosts morale

By Clinton Wilder

SAINT PAUL DE VENCE, France — There was a good deal of uneasiness at Sperry Ltd.'s corporate headquarters in London back in May. Management, employees and customers of Sperry Corp.'s UK subsidiary were almost completely in the dark about what the Sperry-Burroughs Corp. merger would mean for them.

"Morale was pretty low," said David Crofts, Sperry Ltd.'s managing director, during a recent interview at Sperry's annual UK press seminar held in southern France. "We were all thinking and hoping that it wouldn't happen, because we thought the Sperry product lines might be superseded. Our staff and customers expected me to know things that I simply did not, and that was frustrating."

Crofts coincidentally had a scheduled meeting with the UK's Sperry 1100 users group just a few days after the merger, which he said was a blessing in disguise.

'A pretty tense moment'

"It was a pretty tense moment, but it turned out to be rather valuable," Crofts said. "At this point, I think we've reduced the percentage of our users who doubt the future of their Sperry investments from 90% to 20%; there's no way you can eliminate all of that."

Crofts' challenge was eased earlier this month when Burroughs Chairman W. Michael Blumenthal and Sperry President Joseph Kroger made the UK their first stop on a two-week tour of critical user sites in Europe and Asia. Blumenthal visited UK users group Chairman David May as well as five UK Sperry users who are about to make 10-year information systems strategy decisions, Crofts said.

"Those pushing the limits of their computing power obviously need to know if our next-generation systems, such as Saturn and Mercury, are going to come along," Crofts said. "The answer is yes, and Blumenthal was the only guy who could really give the anawer. In a sense, he is the only employee of the new company."

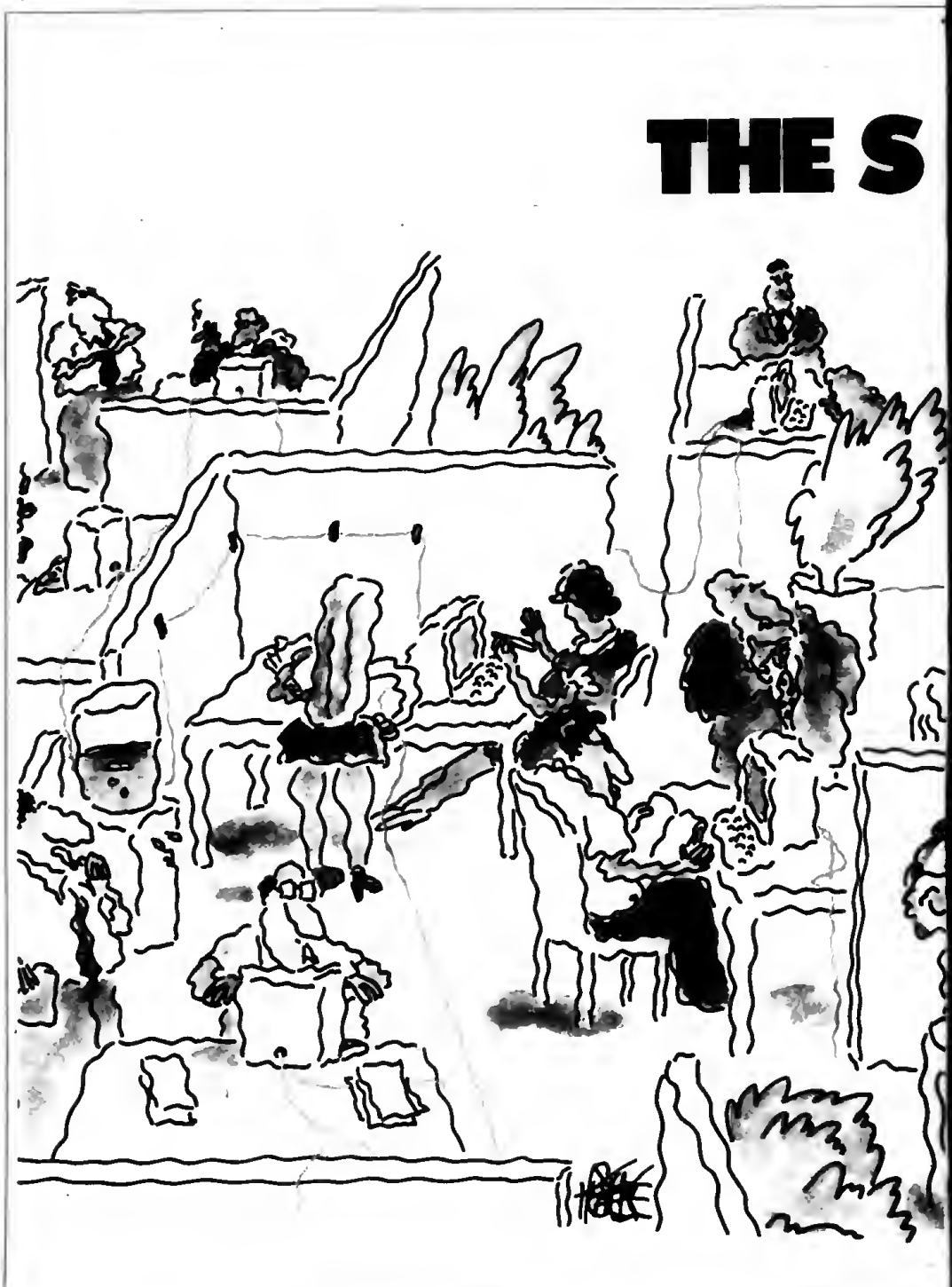
Crofts has not yet been told how much of Blumenthal's targeted $150 million in savings is slated to come from consolidations of Burroughs and Sperry's UK operations, but he doesn't expect much to change in the near term. "All the European subsidiaries are largely sales and service, and in that, the possible savings are limited," Crofts said.

Sperry is the sixth largest computer firm in the UK and a strong player in the British financial industry, a vertical market it has had little success penetrating in the U.S.

Crofts subscribes wholeheartedly to Blumenthal's "critical mass" theory, saying that Sperry Ltd.'s new partner will help it compete better with UK industry leaders IBM, International Computers, Ltd., Digital Equipment Corp. and Honeywell, Inc. Sperry's $225 million in UK sales last year were about half those of Burroughs, the No. 5 vendor.

"Sperry has no manufacturing in the UK, and the chances of getting a plant were slim, but we now have two Burroughs factories in Scotland," Crofts said. "That's an advantage in local selling. I don't think we would have ever passed the companies ahead of us in size, because most of them are growing as fast as we are."

Crofts, who worked for Honeywell when it acquired General Electric Co.'s mainframe line, admitted he had to overcome his own initial akepticism about the merger. "But it soon became clear that this was a very deeply considered move, not just an emergency move to save Burroughs," he said. "This is an industry of change, and we really must not look at change as a threat."



Sharp cancels VLSI chip project with RCA

By Takehisa Kondoh
Computerworld International News Service

OSAKA, Japan — Sharp Corp. has canceled a 1-year-old contract with RCA Corp. under which the two companies were to jointly produce very large-scale integration (VLSI) chips in the U.S.

Sharp said it acted in response to a request from General Electric Co., which acquired RCA in June. GE recently scrapped RCA's plans to construct a major facility in Camas, Wash., with Sharp.

The plant, which was to employ 650 people, had been hailed as a symbol of U.S.-Japanese cooperation in the trade-war-marred chip industry. GE said the venture would unnecessarily duplicate its own semiconductor plants in North Carolina.

The joint VLSI company that Sharp established with RCA in June 1985 was called RCA/Sharp Microelectronics, Inc. It was capitalized at $15.3 million in U.S. dollars, with 51% owned by RCA.

Liquidation of the joint company will cost Sharp its U.S. semiconductor manufacturing base. Sharp, which has become increasingly involved in semiconductors, is now seeking an alternative arrangement.

GE wanted to scrap the deal, a Sharp spokesman said, because GE needs semiconductors for such nonconsumer business sectors as the space program and defense.

IBM hopes to cut DEC gains

From page 110

IBM's System Products Division and the person believed to be masterminding IBM's mid-range product strategy, told a group of financial analysts two days after the IBM announcements that IBM is committed to offering several architectures because of diverse customer needs.

But as any astute market analyst knows, the roots of IBM's three major architectures in the mid-range have a lot more to do with the U.S. vs. IBM antitrust case than with "customer needs." Back in the 1972 to 1973 period, IBM thought that it would be broken up, and it formed the General Business Group to handle its non-370-compatible products.

If we strip away the Personal Computers and the 3090s, that still leaves three different IBM architectures in the intermediate systems range vs. DEC's one.

Schwartz reluctantly conceded that in the foreseeable future, some convergence may take place. "But, at a minimum, we will have two architectures in the mid-range," he said.

The survivors

Schwartz's pronouncement about maintaining at least two mid-range architectures in the foreseeable future introduces one element of certainty in IBM's strategy. But which two will survive? Certainly the 370 will, with the second surviving architecture probably being that of the System/38.

What about the System/36? A combination of the new migration aids and the new communications hardware and software products will try to increase the affinity between the System/36 and the System/38.

The battle lines between IBM and DEC have now been clearly drawn. One of the most exciting aspects of IBM's June announcements is the fact that the products will heighten the rate of competition in the office automation market. Who will be the winner in this battle between the industry's two top companies? The user will. And that's something really worth cheering

Altos purchases Communications Solutions from CDC

Altos Computer Systems, Inc. announced the acquisition of **Communications Solutions, Inc.** from **Control Data Corp.** for an undisclosed price. Altos, a San Jose, Calif.-based manufacturer of multiuser microcomputers, said Communications Solutions, also of San Jose, represents a key investment in the data communications market.

Communications Solutions manufactures IBM-compatible 3270 terminal emulation and office communications software products.

■

Disk drive manufacturer **Priam Corp.** laid off 175 workers from its San Jose, Calif., manufacturing facility recently, bringing the number of workers to 875. The layoffs apply to 100 permanent employees and 75 temporary employees. Priam is expected to post a loss for the quarter ended June 30.

■

Troubled by declining earnings, falling stock prices and shareholder suits, **Daisy Systems Corp.** announced the resignation of cofounder and Executive Vice-President David Stamm.

Stamm will continue to serve as a member of the board of directors. Taking over his responsibilities for Daisy's Electronic Design Automation Group is Andrew Wade, currently vice-president and general manager of Daisy's Digital Design Automation Division.

Speculation surrounding Stamm's resignation involved a reported dispute with Daisy President Aryeh Finegold.

■

Burroughs Corp. Chairman W. Michael Blumenthal wooed **Sperry Corp.** users in Hong Kong at a recent luncheon following the first official joint meeting of Burroughs and Sperry staff in that city. Sperry users expressed relief at Blumenthal's promise during the meeting to maintain Sperry's product lines. Sperry reportedly has five times as many installations in Hong Kong as Burroughs, although Burrougha is said to have more than twice as many units at user sites.

■

Tecmar, Inc., a Columbus, Ohio-based micro board maker, acknowledged that it is negotiating to be acquired by Rexon, Inc., a San Francisco-based maker of computers and storage systems. If the acquisition is consummated, Tecmar President Marty Alpert will retain his job, but other layoffa may take place at Tecmar, according to Tecmar'a investment bankers, Hambrecht & Quist.

■

GTE Corp. and Siemens AG recently decided to join forces in some international markets but will not merge their digital switch technologies in the U.S. as was expected.

Siemens will own 80% of the new joint venture company, which will be based in the U.S. and initially will sell transmission equipment only to telephone companies in Taiwan, Italy and Belgium. These sales will come from GTE's existing base of international sales. In a joint statement, the companies said, "Evaluation of our telecommunications specialists indicated that there were no advantages for merging the technologies of the Siemens EWSD and GTE GTD-5 digital switches into a single system for U.S. applications."

■

Financially troubled **Interdyne Co.** announced that it has agreed in principle to acquire **Peachtree Technology Co.** of Norcross, Ga., for an undisclosed stock offering.

Interdyne is a publicly held company known for the Megafloppy family of tape subsystems and drives for the IBM Personal Computer.

Peachtree manufactures modems and reel-tape backup systems for PCs. It also manufactures a 20M-byte hard disk drive for the Apple Computer, Inc. Macintosh.

INDUSTRY NOTES

■

Telephone systems distributor **USX Telecenters Corp.** of Sunnyvale, Calif., is suing **U.S. Steel Corp.** over its proposed name change to **USX Corp.**

Founded in 1985 by former executives from Rolm Corp. and Businessland, Inc., USX Telecenters is establishing a national franchise of telephone equipment stores.

■

Companies in the computer industry are realizing increased revenues with fewer employees, according to a statistical analysis recently released by the **Computer and Business Equipment Manufacturers Association** (CBEMA).

CBEMA reported that during 1985, revenues for the computer equipment industry were 10% higher than those in 1984, while employment in the industry dropped 8.6% between March 1985 and March 1986.

In the telecommunications industry, revenues increased 7.6% in 1985 while employment dropped 6.1%, CBEMA reported. Contrary to this trend, employment in the computer and data processing services industry rose by 13.3% in 1985, the trade association said, while revenues increased 15.5%.

5¢ NICKELS & DIMES

Hogan Systems, Inc. reported a net profit of $994,000, or 7 cents per share, on revenue of $10.8 million for the first quarter ended June 30. This compares with a $3 million loss, or 23 cents per share, on revenue of $4.1 million for the like period a year ago.

■

Softech, Inc. announced revenue for the year ended May 31 of $45.1 million, compared with $36.4 million in the previous year. Profits for the year were $2.2 million, or 60 cents per share, compared with a loss of $1.2 million, or 49 cents per share, in the like period a year ago.

For the fourth quarter, revenue was $13.2 million, compared with $10.4 million in the same period a year ago. Profits for the fourth quarter were $635,862, or 18 cents per share, compared with a loss of $1.8 million, or 49 cents per share, in the previous year.

■

Seagate Technology reported revenue for the fourth quarter ended June 30 of $141.5 million, compared with $71.8 million reported for the comparable quarter one year ago. Profits were $16.4 million, or 34 cents per share, compared with $712,000, or 1 cent per share, in the previous year.

■

Rexon, Inc. announced revenue for the third quarter ended June 29 of $14.9 million, a 40% increase over $10.6 million reported in the third quarter a year ago. Profits were $887,000, or 12 cents per share, compared with $222,000, or 3 cents per share, in the comparable period one year ago.

■

Bridge Communications, Inc. reported revenue for the second quarter ended June 28 of $10.2 million, a 47% increase over $7 million reported in the second quarter last year. Profits were $1.1 million, or 13 cents per share, compared with $1.2 million, or 16 cents per share, reported in the previous year.

■

Computer Task Group, Inc. announced net income of $1.3 million, or 18 cents per share, on revenue of $35.5 million for the second quarter ended June 30. This compares with net income of $893,000, or 17 cents per share, on revenue of $28.2 million reported in the like period a year ago.

■

Iomega Corp. announced revenue for the second quarter ended June 30 of $29 million, compared with $27.6 million in the like period last year. Profits were $116,000, or 1 cent per share, compared with $3.2 million, or 11 cents per share, one year ago.

■

Dataproducts Corp. reported revenue for the first quarter ended June 28 of $84.4 million, compared with $86.3 million in the previous year. Net income was $2.6 million, or 12 cents per share, compared with a net loss of $19.4 million, or 93 cents per share, in the corresponding period last year.

■

Endata, Inc. announced revenue for the second quarter ended June 30 of $9.6 million, compared with $9.2 million in the previous year. Net income was $832,000, or 20 cents per share, compared with a net loss of $354,000, or 8 cents per share, in the like period a year ago.

■

Intellicorp announced net income of $4.9 million, or 75 cents per share, on revenue of $18.6 million for the year ended June 30. This compares with a net loss of $724,000, or 14 cents per share, on revenue of $8.7 million reported in the previous year.

Net income for the fourth quarter was $3.6 million, or 49 cents per share, on revenue of $5.4 million. This compares with a net income of $340,000, or 6 cents per share, on revenue of $3.4 million for the same period a year earlier.

■

Maxtor Corp. reported revenue for the first quarter ended June 29 of $32.3 million, a 76% increase over revenue of $18.5 million for the like quarter last year. Profits were $4.8 million, or 26 cents per share, up 161% over earnings of $1.8 million, or 16 cents per share, for the first quarter last year.

■

Comsat Corp. announced revenue for the quarter ended June 30 of $120.7 million, compared with $118.9 million in the corresponding period last year. Profits were $14 million, or 77 cents per share, compared with $19.7 million, or $1.08 per share, one year ago.

■

Nashua Corp. announced a 51% increase in net income for the second quarter ended June 27 to $5.8 million, or 60 cents per share, compared with $3.9 million, or 41 cents per share, for the same period last year. Revenue for the quarter was $177.1 million, compared with $153.9 million reported in the same period last year.

■

Pyramid Technology Corp. reported revenue for the third quarter of $10 million, compared with $9.3 million in the like period a year ago. The company reported a net loss of $2.1 million, or 27 cents per share, compared with a net income of $1 million, or 17 cents per share, in the previous year.

■

Applied Magnetics Corp. announced net income for the third quarter of $2.6 million, or 36 cents per share, on revenue of $33.7 million. This compares with net income of $2.6 million, or 39 cents per share, on revenue of $30.1 million reported in the like period a year ago.

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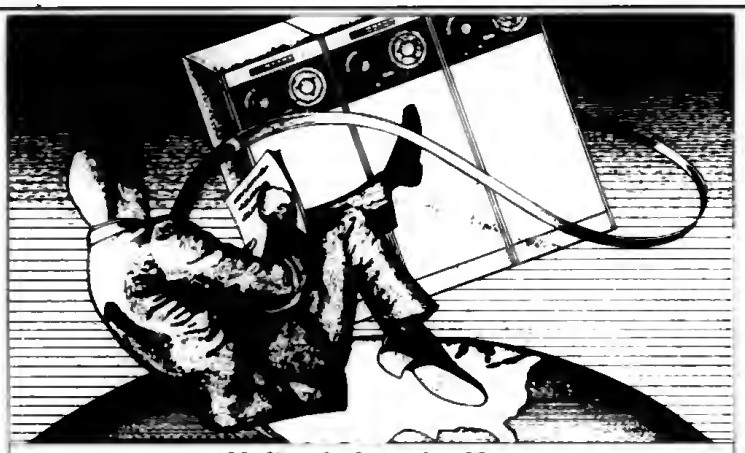

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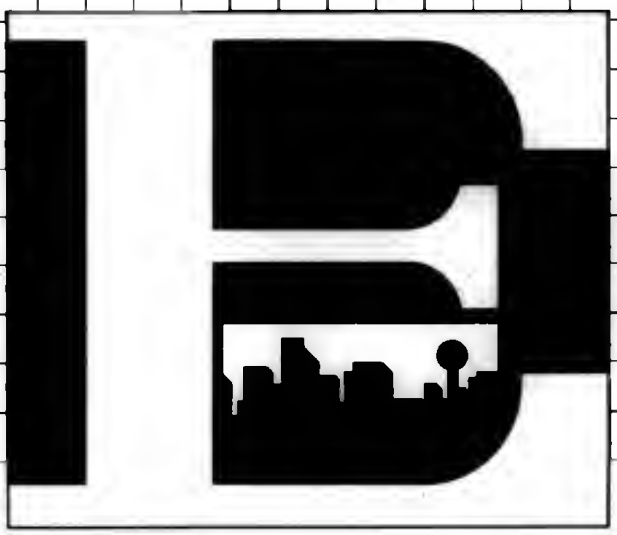

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For consideration for the position, please submit a current resume, salary requirements and names and addresses of three references to the Search and Screening Committee, c/o James E. Johnson, Director of University Computing, University of Wisconsin-Platteville, 1 University Plaza, Platteville, WI 53818. Information should be postmarked no later than August 1, 1986. Position availability is September 1, 1986 or as soon as possible.

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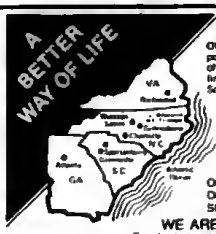

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- August 11 - **Information Centers**
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- Sept. 22 - **Communications Standards**
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Issue: September 17 - Closing: August 8

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A PUBLICATION OF CW COMMUNICATIONS

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Advertisers Index

High-end firms still in slump

From page 110

Analysts, however, were not as optimistic. "Some orders for the 5890 are drying up as customers purchase the 5880 on the assumption that they'll trade up at a later date," noted Louis Giglio of Bear Stearns Cos. "People who are looking for a big revenue kick in the fourth quarter might be in for a surprise."

Control Data. CDC narrowed its losses in the second quarter, posting a $7.8 million deficit after a loss of $21.4 million in the first quarter. A spokeswoman said CDC expects to reach the break-even point some time in 1986, although she said the firm was not predicting when it would report a quarterly profit.

The Minneapolis firm's compoter business was responsible for a $16.4 million operating loss in the second quarter. Overall revenue declined 10% to $828.5 million from the like period last year.

Data General. Chairman Edson D. de Castro said DG's performance in its third fiscal quarter was consistent with the firm's expectations. The Westboro, Mass., firm recorded a net loss of $2 million on a 14% revenue increase to $325.3 million.

The firm reported an operating profit of $200,000 for the quarter, after taking an $11 million charge for estimated expenses incurred in closing its Hong Kong and Austin, Texas, manufacturing facilities.

Now 'just cautious'

A DG spokesman said the firm has not made a projection on when it would return to profitability. "While we once might have said we are cautiously optimistic, we're now saying we're just cautious," the spokesman said.

Wang. Lowell, Mass.-based Wang, which has been reeling from domestic order weakness and is cutting overhead, eked ont an $800,000 profit in the quarter, which contributed to a fiscal 1986 net profit of $50.9 million on revenue of $2.6 billion.

But the quarterly profit resulted from accounting adjustments and the sale of a variety of items, including real estate, which increased net by $19 million and $14 million, respectively. The extraordinary gains were partially offset by a $10 million charge in connection with the company's "voluntary separation" and early retirement plans disclosed earlier this month.

Fourth-quarter performance was helped by a 32% increase in international revenue, owing to a weaker U.S. dollar. Domestic revenue was flat, the firm said.

Wang posted a $109 million net loss in the like quarter a year ago. In fiscal 1985, the firm earned $16.5 million on revenue of $2.3 billion.

Prime. Although the Natick, Mass., firm experienced a surge in orders that it was unable to ship before the end of the quarter, Chairman Joe M. Henson said it was unclear what that portends for the future. "The seasonally weak nature of the third quarter, the weak level of capital spending in the U.S. and the overall economic and industry uncertainty dictate that we remain cautious in our expectations."

In the second quarter, orders increased 22% from the year-earlier period. Orders for CAD/CAM software products increased 45% during the comparable period in 1985.

The strong second quarter boosted first-half revenue to $407.3 million, a 10% increase over the like period last year. Net income for the first half, however, was $20.6 million, down 17% from the same period in 1985.

Stratus. Mariboro, Mass.-based Stratus posted sales of $30 million in the second quarter, a 62% increase over the like period last year. First-half earnings nearly doubled to $6.3 million.

President William E. Foster said the fault-tolerant computer maker met its financial goals in the period.

Tandem. President James Treybig said the Cupertino, Calif., firm's strong third fiscal quarter, in which earnings increased 659% to $18.1 million on revenue of $200 million, resulted from the introduction of new products. He cited the Nonstop VLX system and improvements in Tandem's marketing organization.

Prospects for continued growth, however, are tied to an improvement in the general demand for computer equipment, Treybig said.

Convergent Technologies Corp. San Jose, Calif.-based Convergent continues to struggle in the aftermath of its aborted merger with 3Com Corp. and a decline in business from major OEM customer AT&T. The firm reported a second-quarter loss of $5.1 million, including a nonrecurring charge of $3.4 million, which Convergent said resulted from the resolution of a dispute with an OEM customer. That customer is believed to be AT&T.

The second quarter net loss created a first-half deficit of $3.2 million on revenue of $131.5 million. The firm earned $2.6 million in the comparable period last year on revenue of $193.7 million.

OEM channel won't sustain growth

"Their traditional OEM channel strategy, while successfully taking them to a high level of revenue, is not sufficient to sustain growth," noted Bruce Lupatkin, an analyst at Hambrecht & Quist. "The value-added reseller channel probably won't begin contributing significantly for another six months."

Electronic Data Systems Corp. EDS, the General Motors Corp. computer services subsidiary, turned in another strong performance resulting from increased business both within and outside of GM. Second-quarter profit rose 48% to $52.7 million, bringing first-half net to $118.3 million, up 47% from the comparable period in 1985.

Revenue for the period increased to $1.07 billion, contributing to a first-half 43% revenue gain to $2.06 billion.

Among the factors contributing to the stroog results were contracts with the Georgia Department of Medical Assistance, Guarantee Group, Inc., Ameritech Services and the Vermont Department of Social Welfare.

Intecom, Inc. The private branch exchange maker, which has agreed to be acquired by Wang, recorded a second-quarter loss of $19.8 million on a 13% revenue decline to $24.1 million.

The Allen, Texas, firm said $12.4 million of the loss resulted from a litigation settlement, lower revenue volume and legal expenses relating to the acquisition paid to ANI, Inc. of Portland, Ore.

CAD/CAM vendors' recovery slow but remains intact

ACTIVE ISSUES
Kathy Porteus

If one judged the recovery status of Daisy Systems Corp. (DAZY — 8) and Computervision Corp. (CVN — 10¾) on the basis of recent stock performance, it would seem these turnaround stories have dried up. But according to analysts, the recovery scenario for these companies remains intact despite frustrating industry conditions.

From a high of 30¼ in January, Daisy now trades under 10, reflecting internal problems in shipping new products and continued industry sluggishness. Enthusiasm for Computervision's long overdue workstation product carried the stock to a high of 18¼ in late April, but mixed product reviews and lower capital spending expectations have since pushed down the stock's price.

"For anyone in the engineering workstation business, the going is now generally tougher than it was perceived to be two or three months ago," says Jay Cooper, an analyst with Eberstadt Fleming, Inc. Thus the recovery for Computervision and Daisy is "proceeding a lot more slowly than expected," he says.

More than the capital spending outlook, internal developments have hampered Daisy's recovery, Cooper observes. According to Cooper, commercial deliveries of Daisy's Logician VX, the workstation product based on Digital Equipment Corp.'s Microvax II, are running four to five months behind schedule and probably will not begin until October or November. Beta-test units should be shipped during the current quarter.

Peter Schleider, analyst with L. F. Rothschild, Unterberg Towbin, says the departure two weeks ago of David Stamm, Daisy cofounder and executive vice-president, casts further doubt on the delivery date of Logician VX. "The last calendar quarter is as good a guess as any," Schleider says, "but with Dave's departure, it makes you feel less comfortable." Eberstadt's Cooper says Stamm's resignation provides little indication of Daisy's new product delivery status.

The interest in Daisy's new product deliveries stems from widespread belief that such products are key to the company's near-term recovery. The lack of consensus among analysts as to when Daisy begins commercial delivery is evidenced by the range of Wall Street earnings estimates. According to Zacks Investment Research of Chicago, the current spread of earnings estimates for Daisy's next fiscal year, ending Sept. 30, 1987, is 15 cents to $1.25 per share.

John Rohal, analyst with Alex Brown & Sons, recommends Daisy as a "speculative buy. Investors should be sensitive to the issues, but, on the other hand, I still think Daisy is one of the primary players in what is going to be a very attractive market," Rohal says. He says Computervision's recovery story still has too much "execution risk."

Although Rothschild's Schleider remains neutral on Computervision, he says he has changed his long-standing negative opinion about the company. Based on conversations with beta-site users, Schleider says Computervision is executing a strategy that will enable the company's CADDS 4X software to run on three different hardware platforms. The company's new Caddstation, based on a Sun Microsystems, Inc. workstation, is the first step in this long-term strategy.

Over a period of years, Schleider continues, Computervision will essentially become an applications software company. He says the market has elbowed out traditional computer-aided design and manufacturing turnkey business and adopted hardware standards of IBM and DEC. "Computervision is a good, long-term buy if purchased at 10 or 11," Schleider says.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Software vendors up in downturn

From page 110

Jr. of Prudential-Bache Securities, Inc. "In an environment of severely restrained hardware spending and data center budgets, any product that allows the data center manager to extract more from his resources will sell well."

Software AG's profits nearly doubled in the fourth quarter ended May 31 on sales that grew 33%. For the fiscal year, Software AG said earnings grew 66% to $8.5 million, and sales grew 26% to $65.7 million.

Taylor said that while sales of Software AG's flagship data base product, Adabas, grew less than 10% in the past two quarters, sales of end-user applications such as electronic mail and decision support have doubled. "Their gains all have come from an intelligent move to start to diversify away from data base management in general," he said.

Separately, leading independent computer leasing firm Comdisco, Inc. reported a lower than usual 10% earnings gain on a 50% revenue increase. The results could signal lower margins in the leasing industry as leasing firms seek a competitive edge in a market squeezed by the expected repeal of the investment tax credit.

Comdisco reported third-quarter profits of $19.7 million, or 48 cents per share, on sales of $224.4 million.

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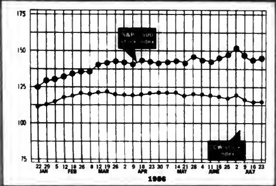
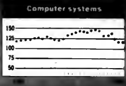
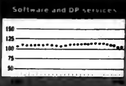
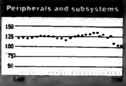
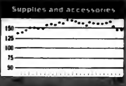
Computerworld stock trading index

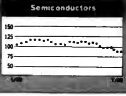












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Computer systems	114.0	114.0
Software and DP services	101.1	101.7
Peripherals and subsystems	101.4	101.1
Supplies and accessories	145.2	147.3
Semiconductors	80.1	[illegible]
Leasing companies	97.3	87.7
CW stock index	112.6	112.7
Standard and Poor s 500 stock index	140.5	142.7

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, JULY 23, 1986

EXCH		52-WEEK RANGE (1)		PRICE CLOSE JULY 23 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS					
O	ALPHA MICROSYSTEMS	8	8	5.50	+0.1	+2.3
O	ALTOS COMPUTER SYS	19	10	13.63	+0.1	+0.8
A	AMDAHL CORP	18	10	17.25	+0.4	+2.2
O	APOLLO COMPUTER INC	23	8	10.88	+0.3	+2.4
O	APPLE COMPUTER INC	39	14	24.13	+0.6	+1.8
N	AT&T	26	20	23.75	-0.3	-1.0
N	BURROUGHS CORP	72	52	64.75	-2.3	-3.4
O	C P T CORP	7	4	4.25	+0.1	+3.0
N	COMPAQ COMPUTER CORP	18	8	12.75	+0.5	+4.1
A	COMPUTER CONSOLES INC	12	8	7.88	-0.1	-1.6
O	CONCURRENT COMP CORP	25	1	13.25	-0.5	-3.6
N	CONTROL DATA CORP DEL	38	18	22.13	-0.6	-2.7
O	CONVERGENT TECH	14	6	6.75	+0.0	+0.0
N	CRAY RESH INC	100	44	89.63	+3.3	+3.8
O	DAISY SYS CORP	22	8	8.38	+0.0	+0.0
N	DATA GEN CORP	50	31	33.00	+0.4	+1.1
N	DATAPOINT CORP	13	5	7.38	+0.4	+5.4
N	DIGITAL EQUIP CORP	94	49	87.00	+3.0	+3.6
N	ELECTRONIC ASSOC INC	7	4	4.25	+0.3	+6.3
N	FLOATING POINT SYS INC	46	18	18.50	-15.4	-45.4
N	GOULD INC	38	18	16.88	-1.0	-5.8
N	HARRIS CORP DEL	38	22	33.50	+0.1	+0.4
N	HEWLETT PACKARD CO	48	29	38.75	+2.4	+6.5
N	HONEYWELL INC	87	59	65.88	-3.1	-4.6
N	IBM	162	122	133.13	+0.0	+0.0
O	IPL SYS INC	4	1	3.00	+0.0	+0.0
N	ITT CORP	50	31	54.25	+1.3	+2.4
N	M A COM INC	23	13	14.25	-2.0	-12.3
N	MATSUSHITA ELEC INDL LTD	100	49	78.63	-2.9	-3.5
O	MENTOR GRAPHICS CORP	22	12	13.50	+1.1	+8.1
N	MODULAR COMPUTER SYS	8	8	8.88	+0.0	+0.0
N	MOHAWK DATA SCI CORP	4	1	2.25	-0.3	-10.0
N	NBI INC	20	10	10.88	-0.6	-5.4
N	NCR CORP	57	31	50.25	+0.1	+0.2
N	PRIME COMPUTER INC	38	18	18.63	+2.3	+13.7
N	SPERRY CORP	75	46	75.38	+0.1	+0.2
O	STRATUS COMPUTER	26	18	16.25	+0.5	+2.7
O	SYMBOLICS INC	16	7	7.63	+0.4	+5.2
O	TANDEM COMPUTERS INC	34	13	33.75	+5.0	+17.4
N	TANDY CORP	45	20	34.50	+1.1	+3.4
N	TEXAS INSTRS INC	146	46	104.63	-6.1	-5.5
A	ULTIMATE CORP	38	11	22.50	-0.1	-0.6
A	WANG LABS INC	25	12	13.50	+0.5	+3.8
A	WANG LABS INC	25	11	13.13	+0.1	+1.0
N	XEROX CORP	72	46	52.63	+1.8	+3.4
	SUPPLIES & ACCESSORIES					
N	AMER BUSINESS PRODS	37	25	32.38	-0.8	-2.3
N	BARRY WRIGHT CORP	25	17	18.38	+0.6	+3.5
A	DUPLEX PRODS INC	23	17	20.25	+1.4	+7.3
N	ENNIS BUSINESS FORMS INC	38	18	23.75	-0.3	-1.0
N	3M CO	115	74	110.25	+4.1	+3.9
N	MOORE LTD	38	18	25.13	-0.3	-1.0
O	STANDARD REGISTER CO	20	20	37.25	+0.3	+0.7
N	WALLACE COMPUTER SVCS	50	33	46.00	-0.3	-0.6

EXCH: N=NEW YORK, A=AMERICAN; P=PACIFIC; B=BOSTON; L=NATIONAL; M=MIDWEST, O=OVER-THE-COUNTER

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		52 WEEK RANGE (1)		PRICE CLOSE JULY 23 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & DP SERVICES					
O	ADVANCED COMP TECH	7	3	4.88	+0.0	+0.0
N	ADVANCED SYS INC	20	11	17.38	+0.8	+4.8
N	AGS COMPUTERS INC	25	14	17.88	+0.1	+0.7
O	AMERICAN MGMT SYS INC	20	7	16.75	+0.3	+1.8
O	AMERICAN SOFTWARE INC	16	8	12.38	+0.1	+1.0
N	ANACOMP INC	7	3	8.38	+0.4	+7.8
O	ANALYSTS INTL CORP	10	6	5.25	-0.3	-4.5
O	ASHTON TATE	34	10	23.75	-0.8	-3.6
O	ASK COMPUTER SYS INC	15	7	9.63	-0.3	-2.8
O	ASTRADYNE COMP IND	3	1	1.31	-0.1	-4.8
N	AUTOMATIC DATA PROC	39	16	33.38	+2.3	+7.2
O	COMPUTER ASSOC INTL INC	25	10	20.75	+0.8	+3.6
O	COMPUTER HORIZONS CORP	16	10	11.00	-0.3	-2.2
O	COMPUTER NETWORK TECH	10	2	8.56	-0.4	-5.4
N	COMPUTER SCIENCES CORP	40	16	34.00	+0.3	+0.7
O	COMPUTER TASK GROUP INC	18	11	12.75	+0.0	+0.0
O	COMPUTONE SYS INC	7	2	2.63	-0.1	-4.8
O	COMSHARE INC	13	6	12.00	+0.0	+0.0
N	CULLINET SOFTWARE INC	27	10	10.88	-0.4	-3.3
O	CYCARE SYS INC	17	10	12.13	+0.1	+1.0
O	DUQUESNE SYS INC	45	11	29.00	+2.3	+5.4
N	GENERAL ELEC CO	63	56	75.00	-0.5	-0.7
N	GENERAL MTRS CORP	50	33	43.63	+0.4	+0.8
N	GTE CORP	56	38	56.00	+0.3	+0.8
O	HOGAN SYS INC	12	4	10.50	-0.1	-1.2
O	INFORMATION SCIENCES INC	4	1	3.00	+0.0	+0.0
O	INFOTRON SYS CORP	23	12	12.00	-1.0	-7.7
O	KEANE INC	18	8	8.75	-5.3	-37.8
N	LOGICON INC	43	27	27.50	-0.8	-2.7
O	LOTUS DEV CORP	39	18	22.88	-2.8	-7.4
O	MANAGEMENT SCI AMER	18	8	14.25	+1.3	+8.8
O	MCI COMM CORP	13	6	8.63	-0.3	-2.3
O	MICOM SYS INC	25	11	11.25	-0.5	-4.3
O	MICRO PRO INTL CORP	4	2	2.38	+0.1	+5.8
O	MICROSOFT CORP	38	25	30.00	+1.0	+3.4
O	NATIONAL DATA CORP	26	11	18.88	+1.8	+8.6
O	ON LINE SOFTWARE INT	18	8	12.50	+0.6	+5.4
O	ORACLE SYS CORP	29	17	17.75	+0.0	+0.0
N	PANSOPHIC SYS INC	38	18	39.75	-0.8	-1.8
N	PLANNING RESH CORP	24	14	18.13	+1.8	+10.6
O	POLICY MGMT SYS CORP	24	15	16.25	+1.0	+8.8
O	PROGRAMMING & SYS INC	11	8	9.00	+0.4	+4.3
O	REYNOLDS & REYNOLDS CO	35	18	31.50	+1.8	+6.0
O	SCIENTIFIC COMPUTERS INC	8	4	4.44	+0.1	+1.4
O	SEI CORP	26	16	18.00	+0.0	+0.0
O	SHARED MED SYS CORP	41	39	22.63	+0.3	+0.8
O	SOFTWARE AG SYSTEMS INC	22	13	17.38	+0.0	+0.0
O	SOFTWARE PUBG CORP	12	5	6.50	+1.1	+20.9
A	STERLING SOFTWARE INC	21	7	17.75	+0.4	+2.2
N	UCCEL CORP	23	13	20.25	+0.3	+1.3
N	URS CORP	16	10	16.13	-0.1	-0.8
O	VM SOFTWARE INC	22	17	27.00	+1.0	+3.6
	SEMICONDUCTORS					
N	ADVANCED MICRO DEV	34	14	14.63	+0.1	+0.9
N	ANALOG DEVICES INC	25	14	18.75	+1.0	+6.3
O	ANALOGIC CORP	18	11	10.63	-0.5	-4.5
N	APPLIED MAGNETICS CORP	20	12	14.25	-1.0	-6.6
O	AVANTEK INC	24	17	17.25	-0.1	-0.7
O	HADCO CORP	7	4	4.50	-0.3	-5.3
O	INTEL CORP	32	17	19.00	-0.4	-2.0
O	MICRO MASK INC	8	3	4.25	+0.5	+13.3
N	MOTOROLA INC	50	39	35.75	+1.6	+4.8
N	NATIONAL SEMICONDUCTOR	18	6	6.25	-0.3	-2.6
N	TERADYNE INC	30	17	16.50	+0.4	+2.0

EXCH		52-WEEK RANGE (1)		PRICE CLOSE JULY 23 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	PERIPHERALS & SUBSYSTEMS					
A	AM INTL INC	6	3	6.63	-0.4	-5.4
A	ANDERSON JACOBSON INC	3	2	2.25	+0.1	+5.6
O	AST RESH INC	33	11	11.75	+0.3	+2.2
O	AUTOTROL CORP	10	6	7.25	-0.6	-7.6
O	AVANT GRADE COMPUTING	10	3	3.88	+0.1	+3.3
O	BANCTEC INC	13	7	8.38	+0.6	+11.7
N	BOLT BERANEK & NEWMAN	48	27	39.38	-0.6	-1.6
O	CAMBEX CORP	2	1	1.00	+0.0	+0.0
N	CENTRONICS DATA COMP	8	3	6.75	-0.1	-1.8
A	CETEC CORP	8	8	6.88	-0.3	-3.8
A	COGNITRONICS CORP	6	4	3.88	+0.0	+0.0
N	COMPUGRAPHIC CORP	30	18	18.13	+0.0	+0.0
N	COMPUTERVISION CORP	16	6	11.50	-0.3	-2.1
N	CONRAC CORP	18	11	16.25	+0.5	+3.4
A	DATAPRODUCTS CORP	18	11	14.00	-0.6	-4.3
A	DATARAM CORP	18	5	7.75	+0.6	+8.8
O	DATA SWITCH CORP	8	4	8.38	-0.1	-1.6
O	DATUM INC	7	5	5.75	+0.1	+2.2
N	DECISION INDS CORP	19	6	8.50	1.8	-14.8
O	ENDATA INC	8	3	5.38	-0.8	-12.2
O	EVANS & SUTHERLAND	27	15	20.13	-0.3	-1.2
N	FLOATING POINT SYS INC	46	18	16.50	-15.4	-45.4
O	GANDALF TECHNOLOGIES	8	5	6.25	-0.1	-1.0
N	GENERAL DATACOMM IND	15	8	10.50	-0.3	-2.3
N	HAZELTINE CORP	30	18	17.50	-2.0	-10.3
O	ICOT CORP	13	6	8.63	-0.1	-1.3
O	INFORMATION INTL INC	18	10	16.25	+0.0	+0.0
O	INTECOM INC	7	3	4.88	+0.1	+2.7
O	INTERLEAF INC	18	8	10.00	+0.0	+0.0
O	MEGADATA CORP	9	3	3.44	-0.2	-5.2
A	MSI DATA CORP	14	8	11.38	+0.4	+3.4
N	NASHUA CORP	28	12	24.25	+1.4	+6.0
O	NETWORK SYS CORP	27	10	11.48	+0.9	+6.0
N	NORTH AMERN PHILIPS CORP	46	32	38.50	+0.4	+1.0
N	NORTHERN TELECOM LTD	39	25	27.75	+0.4	+1.4
O	NOVELL INC	21	8	16.00	-0.5	-2.7
O	OMEX	1	0	0.83	+0.0	+0.0
N	PARADYNE CORP	13	8	7.13	+0.3	+3.6
A	PENRIL CORP	10	8	5.50	-0.3	-4.3
N	PLESSEY PLC	38	18	32.00	+0.1	+0.4
O	PRINTRONIX INC	15	10	11.88	-0.1	-1.0
O	QMS INC	18	6	13.75	+0.6	+4.8
O	RAMTEK CORP	7	2	5.13	+0.0	+0.0
N	RECOGNITION EQUIP INC	17	8	12.00	+0.8	+6.7
N	SANDERS ASSOC INC	63	29	58.76	+0.3	+0.4
O	SCAN TRON CORP	24	12	17.75	+0.0	+0.0
N	SCIENTIFIC ATLANTA INC	15	6	9.00	-0.5	-5.3
O	SEAGATE TECHNOLOGY	14	6	11.75	+0.4	+3.3
N	STORAGE TECHNOLOGY	7	1	3.00	+0.1	+4.3
O	SUN MICROSYSTEM INC	20	12	16.25	+2.1	+16.2
A	T BAR INC	7	5	5.75	+0.5	+6.5
A	TAB PRODS CO	18	10	13.75	+0.0	+0.0
O	TANDON CORP	8	3	4.75	-0.3	5.0
A	TEC INC	11	4	4.50	+0.4	+9.1
N	TEKTRONIX INC	65	47	56.13	-0.6	-1.1
O	TELEVIDEO SYS INC	4	2	3.13	-0.1	-3.8
N	TELEX CORP	66	40	56.50	+3.8	+7.1
N	TIMEPLEX INC	24	14	16.38	-0.5	-3.1
N	TITAN CORP	12	8	8.13	-0.6	-6.7
O	VISUAL TECHNOLOGY INC	2	0	0.56	+0.1	+12.4
O	WYSE TECH	18	7	14.00	+0.3	+1.8
	LEASING COMPANIES					
N	COMDISCO INC	25	11	19.25	+1.0	+5.5
N	CONTINENTAL INFO SYS	12	8	8.75	+0.3	+2.6
O	FINALCO GROUP INC	9	3	3.25	+0.0	+0.0
O	PHOENIX AMERN INC	8	2	3.75	+0.0	+0.0
O	SELECTERM INC	12	8	6.31	-0.2	-2.8
N	U.S. LEASING	46	32	39.00	-1.0	-2.5

COMPUTER INDUSTRY

INSIDE

INSTANT ANALYSIS

"We continue to believe that the industry is unlikely to get firmly back on its feet again much before the second half of 1987."

— **Stephen K. Smith, Paine Weber, Inc.**

High-end firms still in slump

Wang, Amdahl suffer in sluggish domestic market

By Alan Alper

NEW YORK — Following a trend set by IBM, Honeywell, Inc. and Sperry Corp. [CW, July 21], large computer hardware firms continued to report generally sluggish financial results last week.

High-end hardware seems to be suffering more than other sectors of the industry. Amdahl Corp. reported a small revenue gain and profits decline, and Control Data Corp., although narrowing its losses, still reported a decline in revenue, attributed in part to softer domestic demand for mainframe computers.

Mid-range computer makers, with the notable exceptions of Data General Corp. and Wang Laboratories, Inc., reported fairly strong results. Prime Computer, Inc., Stratus Computer, Inc. and Tandem Computers, Inc. showed revenue increases of anywhere from 12% to 62% for the quarter.

Stratus and Tandem, in particular, posted hefty profit gains, while Prime, citing continued investments in research and development, sales personnel and computer-aided design and manufacturing, reported a slight decline in earnings.

"These are companies doing well in niche markets," noted Donald Haback, a Great Neck, N.Y., independent consultant who was formerly with Smith Barney, Harris Upham & Co. "Prime, for instance, has emphasized CAD/CAM and has done a good job winning business in that area."

Leading companies reporting results for the quarter ended in June were the following:

Amdahl. President John C. Lewis said that although revenue growth was slight and earnings lower in the second quarter, results should turn stronger later this year when the firm's 5890 large-sale processor enters production.

See **HIGH-END** page 108

Software key in IBM/Fujitsu talks

By Edward Warner

ARMONK, N.Y. — IBM has confirmed that its current secret arbitration talks with Fujitsu Ltd. center only on Fujitsu's alleged copying of IBM's MVS/XA software, putting to rest worries of vendors planning to market Fujitsu mainframes. No Fujitsu hardware is involved in the dispute, an IBM spokesman confirmed.

Both Siemens AG of West Germany and Amdahl Corp. of Sunnyvale, Calif., are said to be considering the addition of the Fujitsu M-780 mainframe to their product lines. Siemens has had talks with Fujitsu regarding the machine, and Amdahl, of which Fujitsu owns 47.5%, already uses Fujitsu components in several of its mainframes and is reportedly looking for a processor to form the basis of its next generation of machines.

A prolonged dispute between IBM and Fujitsu over Fujitsu mainframe hardware, however, could have jeopardized those plans.

Sources close to the talks say IBM's complaint against Fujitsu centers on Fujitsu's alleged copying of portions of IBM's MVS operating system for use in its IBM-compatible MSP OSIV/F4 operating system. In March, Siemens stopped selling its version of MSP OSIV/F4, saying Fujitsu's dispute with IBM raised questions about the operating system's viability.

While not stipulating which Fujitsu programs are involved in the dispute, IBM spokesman J. Lyle McGuire said there is "no hardware, just software" involved in IBM's complaint.

McGuire added that IBM expects progress to come out of the next several months of talks.

A Fujitsu spokesman in Tokyo denied that his firm had engaged in any wrongdoing.

INDUSTRY INSIGHT
Bob Djurdjevic

IBM hopes to cut DEC gains

In an effort to halt Digital Equipment Corp.'s market share gains at its expense, IBM unleashed a flurry of low-priced products last month. The IBM announcements carried two central themes: connectivity (among the various IBM architectures) and affinity (between the System/36, 38 and the 370 architectures).

Often criticized for its disparate product lines, IBM obviously intended to address this major weakness in the company's intermediate systems strategy. That is where several incompatible product lines have made IBM vulnerable to competitors like DEC, which offers growth within a single architecture. In fact, Annex Research's latest analysis of the U.S. installed base shows that IBM had lost about 3% market share in 1985 — about the amount of DEC's market share gains during the same period.

What does IBM's connectivity theme really mean? It means that IBM will try to link the architecturally disparate product lines by using layers of new communications hardware and software products. This should make them transparent to the end user.

And what about the second theme — the affinity? Is IBM trying to tell us that a romance among its heretofore distant computers is in the offing?

Stephen Schwartz, president of

See **IBM** page 83

Djurdjevic is a computer industry analyst and president of Annex Research, a Phoenix-based computer research and consulting firm.

Microsoft, other software vendors up in hardware industry downturn

By Clinton Wilder

Continuing to buck the trend of the sluggish computer hardware industry, Microsoft Corp. and several leading mainframe software vendors reported strong growth in second-quarter financial reports announced last week.

While Microsoft ended the fiscal year at nearly $200 million in revenue, Computer Associates International, Inc., Software AG Systems, Inc. and VM Software, Inc. all reported solid year-to-year gains in profits and sales during the quarter.

Microsoft rode unexpected growth in overseas business to a 105% earnings gain in its fourth quarter ended June 30. The Redmond, Wash., developer of MS-DOS earned $11.5 million, or 42 cents per share, on revenue that grew 67% to $62 million.

For the year, revenue advanced 41% to $197.5 million, and profits grew 62% to $39.2 million, or $1.56 per share.

"They have not disappointed in any quarter yet since going public," said Ruthann Quindlen, an analyst with Alex Brown & Sons. "It is significant that 40% of their revenue for the year was international sales. They were there early with local language products, and they have a stronger foothold in applications overseas than in the U.S."

Computer Associates reported an 82% increase in net income for the quarter, while VM Software's profit grew 64%. "Systems utilities clearly have been the preferable part of the packaged software business during the downturn," said Charles Taylor

See **SOFTWARE** page 108

Mainframes, minis continue second-quarter slide

But Cray, Microsoft, Stratus and Tandem profits soar

Company	Net income April-June, 1986 (thousands of dollars)	Percent Change From 1985	Revenue April-June, 1986 (thousands of dollars)	Percent Change From 1985
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Comdisco	19,763	+10	224,471	+50
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Control Data[2]	(20,300)		828,500	-9
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Data General[3]	(2,000)		325,300	+14
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Prime	11,422	-13	210,547	+12
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Stratus	3,276	+74	30,157	+63
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wang[4]	800		716,900	+13
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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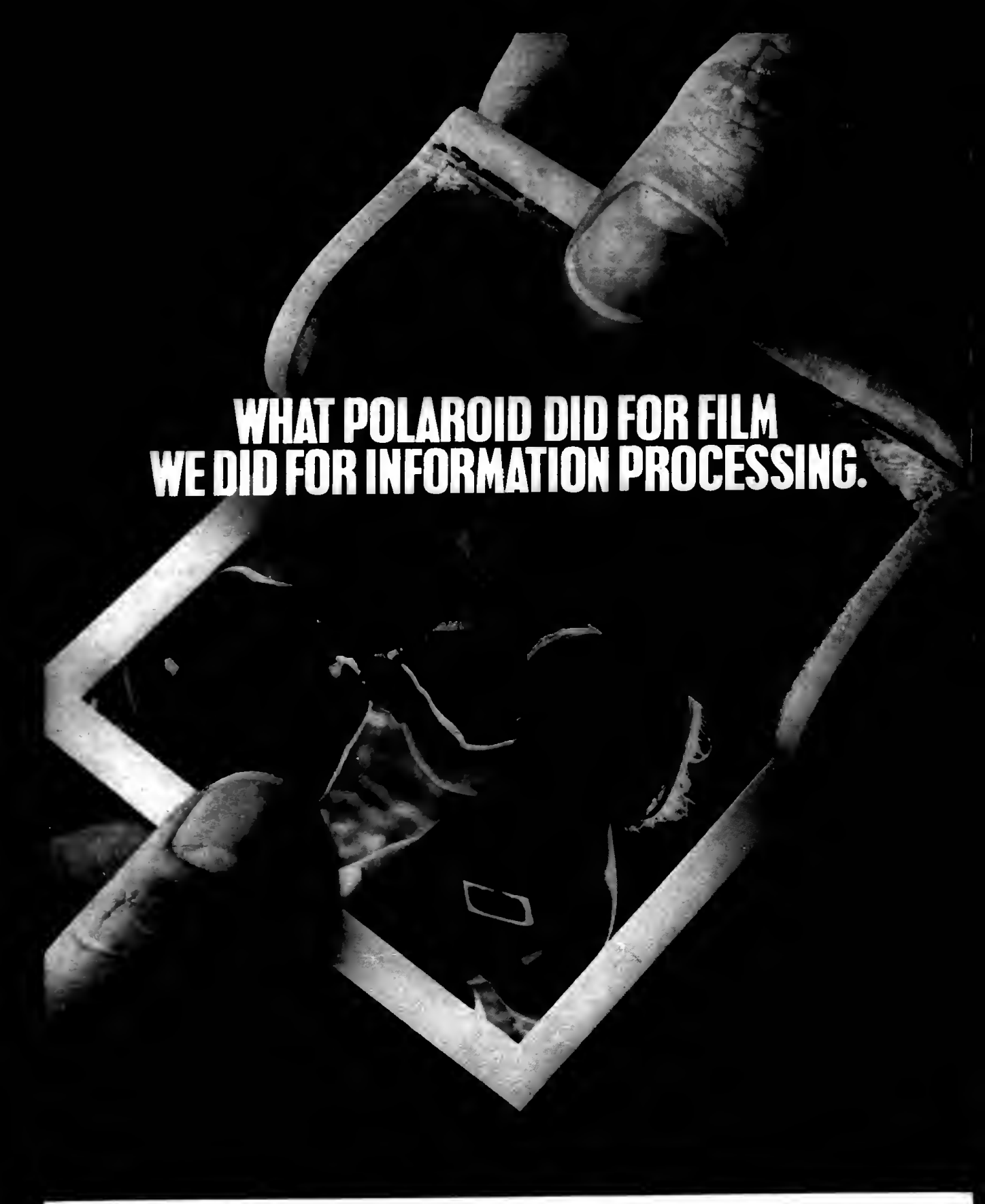

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